



THE RESOURCE FOR INFORMATION EXECUTIVES



# NOTHING BUT VALUE



**Breakthrough  
Customer Care**  
PAGE 46

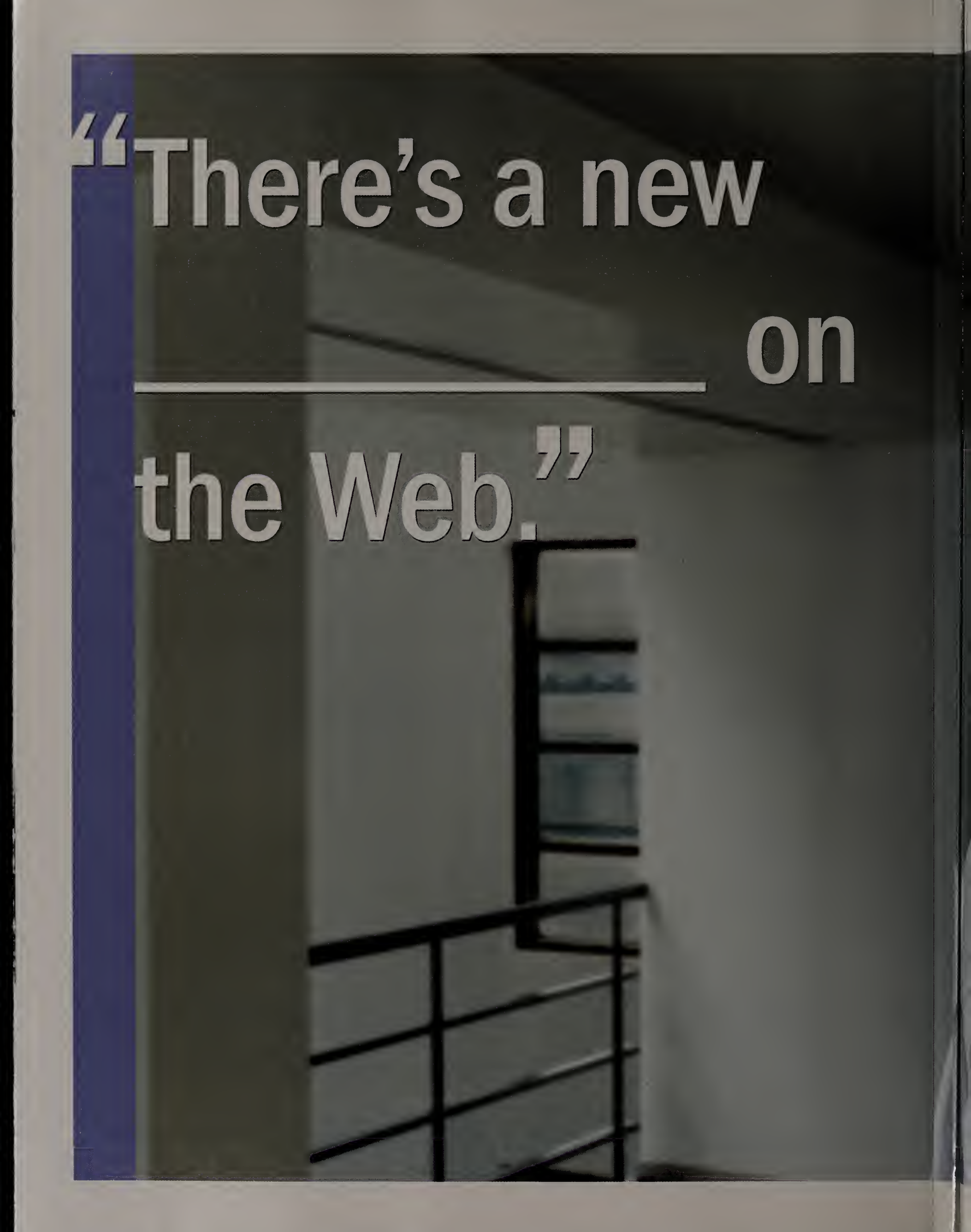
**Competitive  
Branding**  
PAGE 52

**Maximum  
Workflow  
Efficiency**  
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**Fastest Time  
to Market**  
PAGE 68

**Universal  
Information  
Access**  
PAGE 74

**How Five Enterprises Deliver  
How You Can Too**



**“There’s a new  
\_\_\_\_\_ on  
the Web.”**





**Microsoft®**

# “Are we secured against

**Anything can happen to your infrastructure. Make sure it's secure.** The evolution of the Internet has led to increased security vulnerabilities for any Internet-enabled company. In this difficult and challenging environment, where \_\_\_\_\_ can happen at any moment, Microsoft understands that you need to keep your infrastructure prepared for anything and everything by getting it secure and keeping it secure. Here's what we're doing, along with our industry partners, to help right now:

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---

Microsoft is providing tools, services, and guidance to help you get and stay secure right now. For example, tools such as Microsoft® Windows® Update, Microsoft Software Update Services, and Microsoft Systems Management Server are helping customers control and automate the identification, collection, and application of security patches today. Plus, our Security Response Center is staffed seven days a week to investigate any reported security vulnerabilities in Microsoft products. You can also get immediate free support for virus-related incidents on Microsoft products and free prescriptive guidance on securing your Windows systems.

## **Partnerships and products to further secure your infrastructure today**

---

The Microsoft Gold Certified Partner Program for Security Solutions helps you locate the best providers of security solutions for your IT environment. Microsoft Gold Certified Partners for Security Solutions have proven experience, validated by their customers, in delivering robust, secure implementations of Microsoft technologies. The technologies include key infrastructure security products such as Microsoft Internet Security and Acceleration (ISA) Server 2000, an ICSA-certified firewall; Systems Management Server 2.0, a management tool for distributing security patches; and the Microsoft Active Directory® service, a central repository for all user- and resource-identity management information.



# gainst that?"

## **The future of Microsoft products: designing and engineering for maximum security**

---

Microsoft has implemented engineering standards and processes that focus on building greater security into our products during design and development. Some highlights of the new processes include:

- Creating stronger default policies on all software, and fewer services enabled by default, to deliver software solutions that are more secure by default
- Performing exhaustive cross-team security code reviews to help identify and address potential vulnerabilities before the software is released
- Developing and refreshing new threat models to help counter constantly evolving security risks

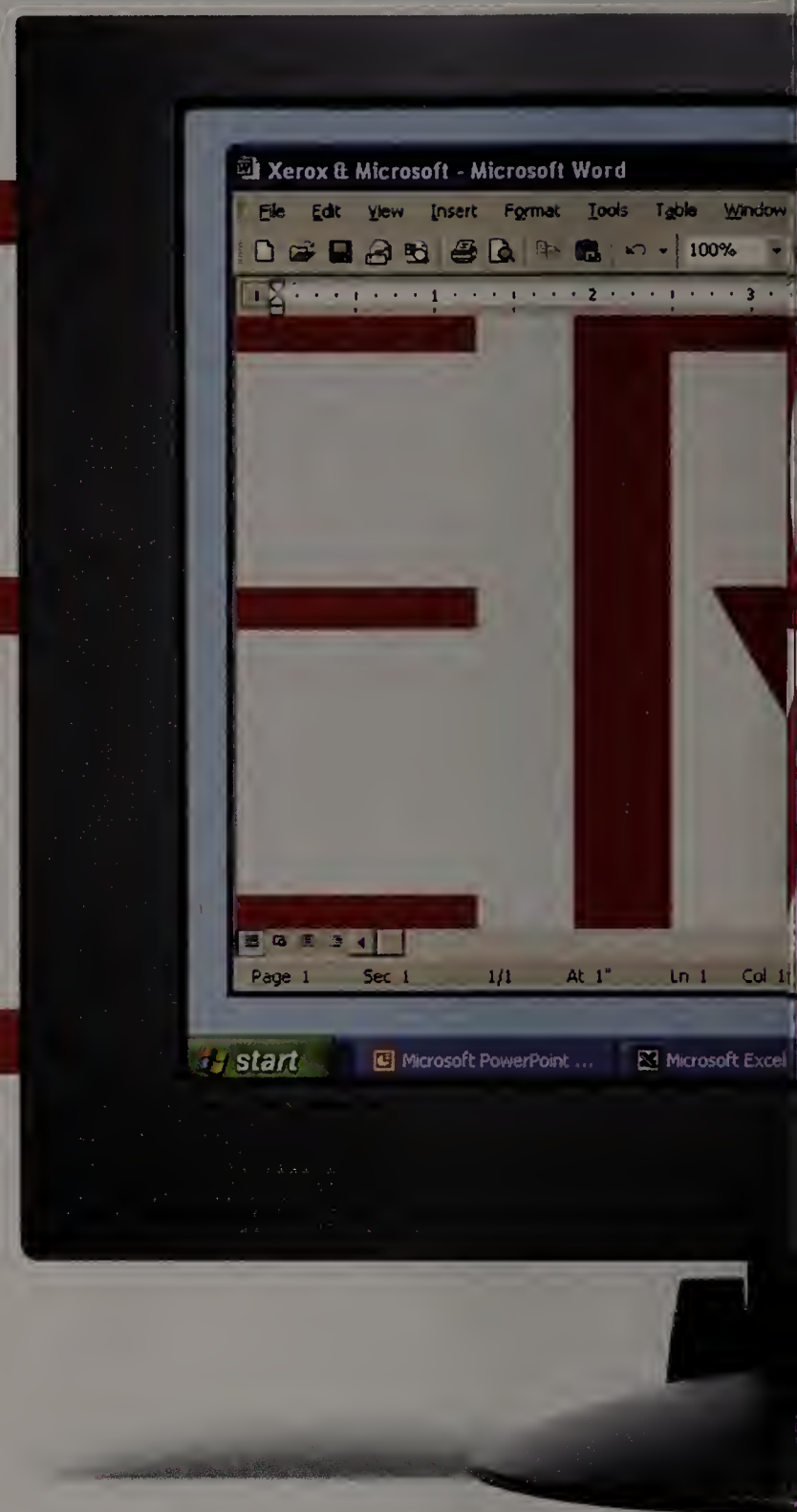
*"Unisys security services, partnered with Microsoft products and solutions, provide our customers with highly secure and cost-effective mission-critical solutions."*

*—Sunil Misra, Managing Principal,  
Worldwide Security Practice, Unisys*

For resource kits, webcasts, and other information that can help you get your network infrastructure secure enough to handle \_\_\_\_\_, or even a \_\_\_\_\_, visit [microsoft.com/enterprise/security](http://microsoft.com/enterprise/security) **Software for the Agile Business.**

# X

# E

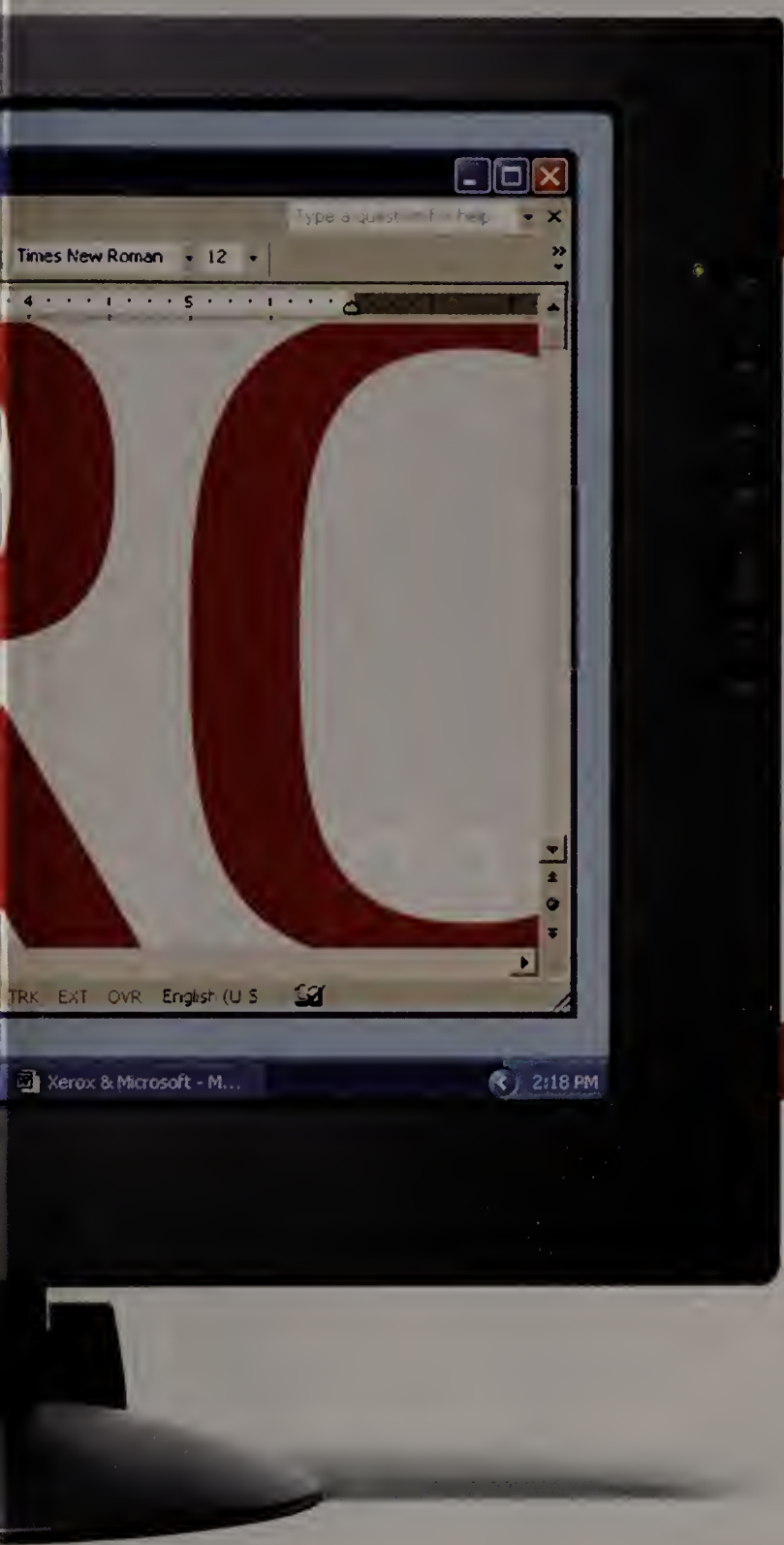


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how CDMA2000 gives you always-on remote access in a protected environment at speeds faster than dial-up. Best of all, CDMA2000 delivers anywhere that your wireless carrier has coverage, across the entire country. Plus, you won't have to fill up on double lattes while accessing your network. To learn more, visit us at [www.qualcomm.com/enterprise](http://www.qualcomm.com/enterprise).



VOL. 16 • NO. 8 • FEBRUARY 1, 2003

## THE 11TH ANNUAL ENTERPRISE VALUE AWARDS

# NOTHING BUT VALUE

## Special Issue

### OVERVIEW

#### Nothing But Value | 42

The winners of the 2003 Enterprise Value Awards demonstrate the need for solid business cases when investing in IT.

*By Richard Pastore*



**Wharton CIO Gerry McCartney rewrote the rules when it came to his Enterprise Value Award-winning research storage and retrieval system—he offered it to his fiercest competitors.**



#### UNIVERSITY OF ILLINOIS MEDICAL CENTER Off the Charts | 46

An electronic medical records system at the University of Illinois Medical Center did more than transform communication, it converted the least likely users into technology believers.

*By Christopher Koch*



#### WHARTON SCHOOL Best in Class | 52

By licensing its database research service to business schools worldwide, the Wharton School brand earns high marks.

*By Elana Varon*



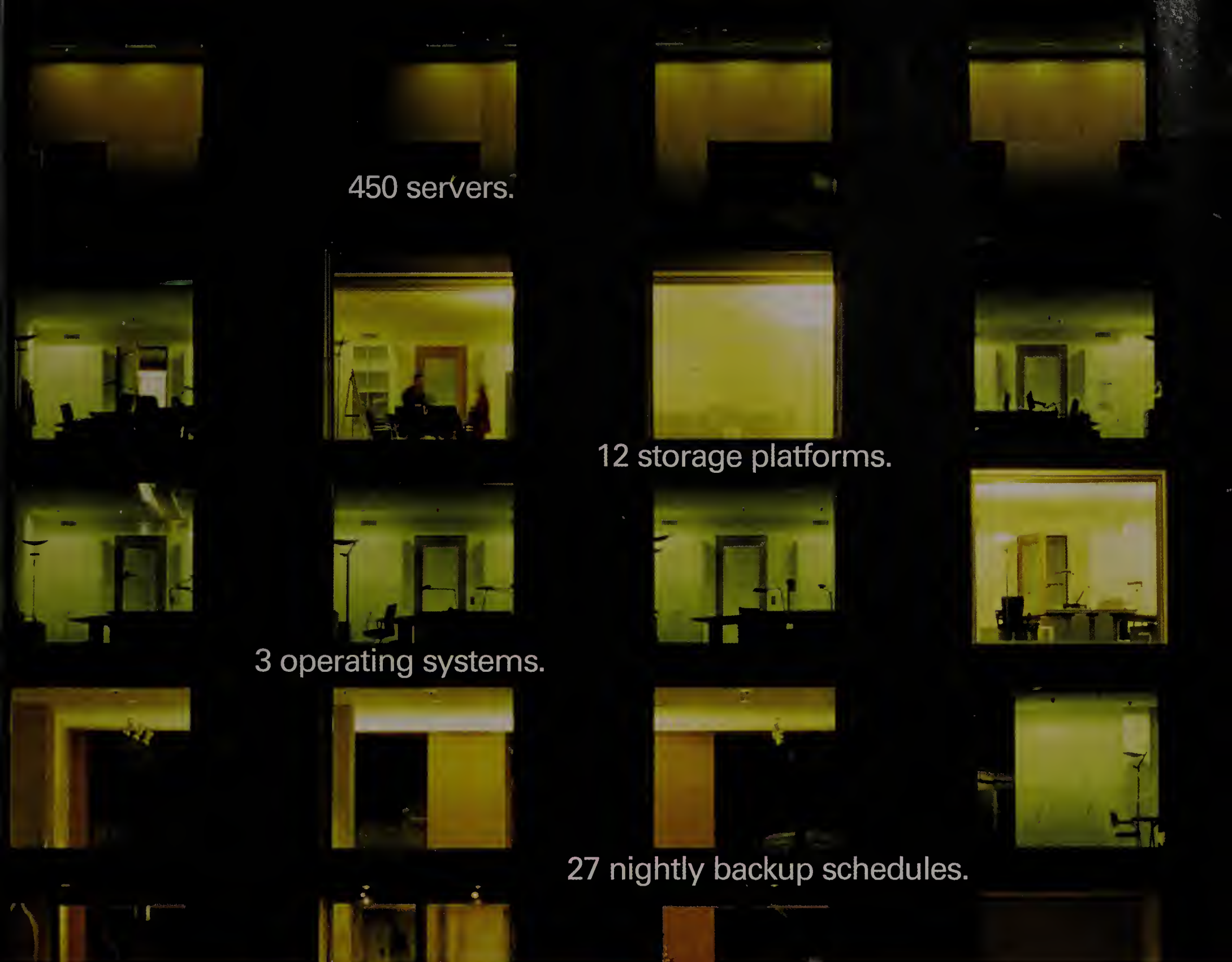
#### CON-WAY TRANSPORTATION SERVICES Cruise Control | 60

This freight delivery company's leaders took four years to get a new expert system right. Now they're watching as the benefits roll in. *By Richard Pastore*

MORE ►►►

COVER PHOTO BY PETE MCARTHUR





450 servers.

12 storage platforms.

3 operating systems.

27 nightly backup schedules.

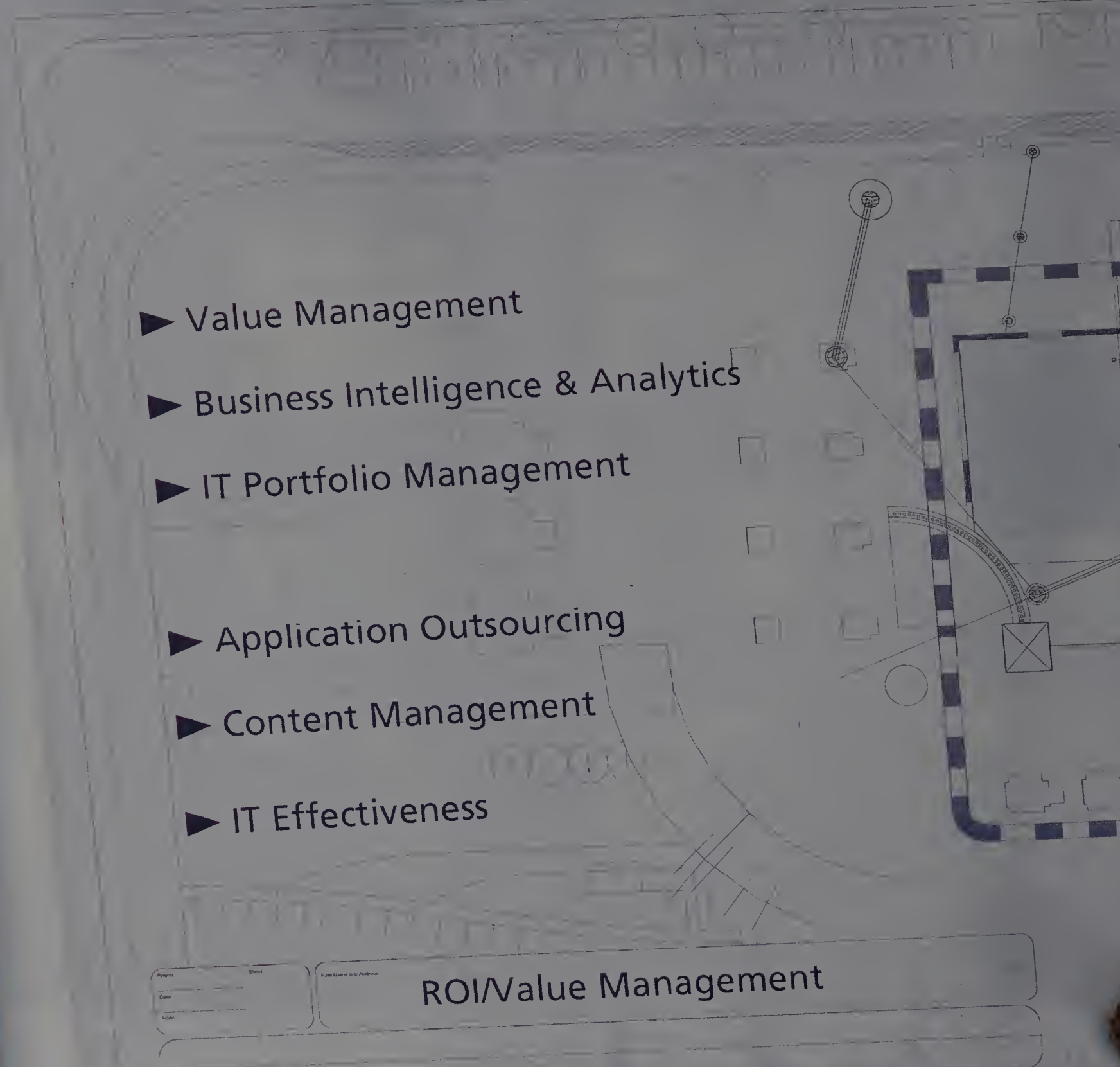
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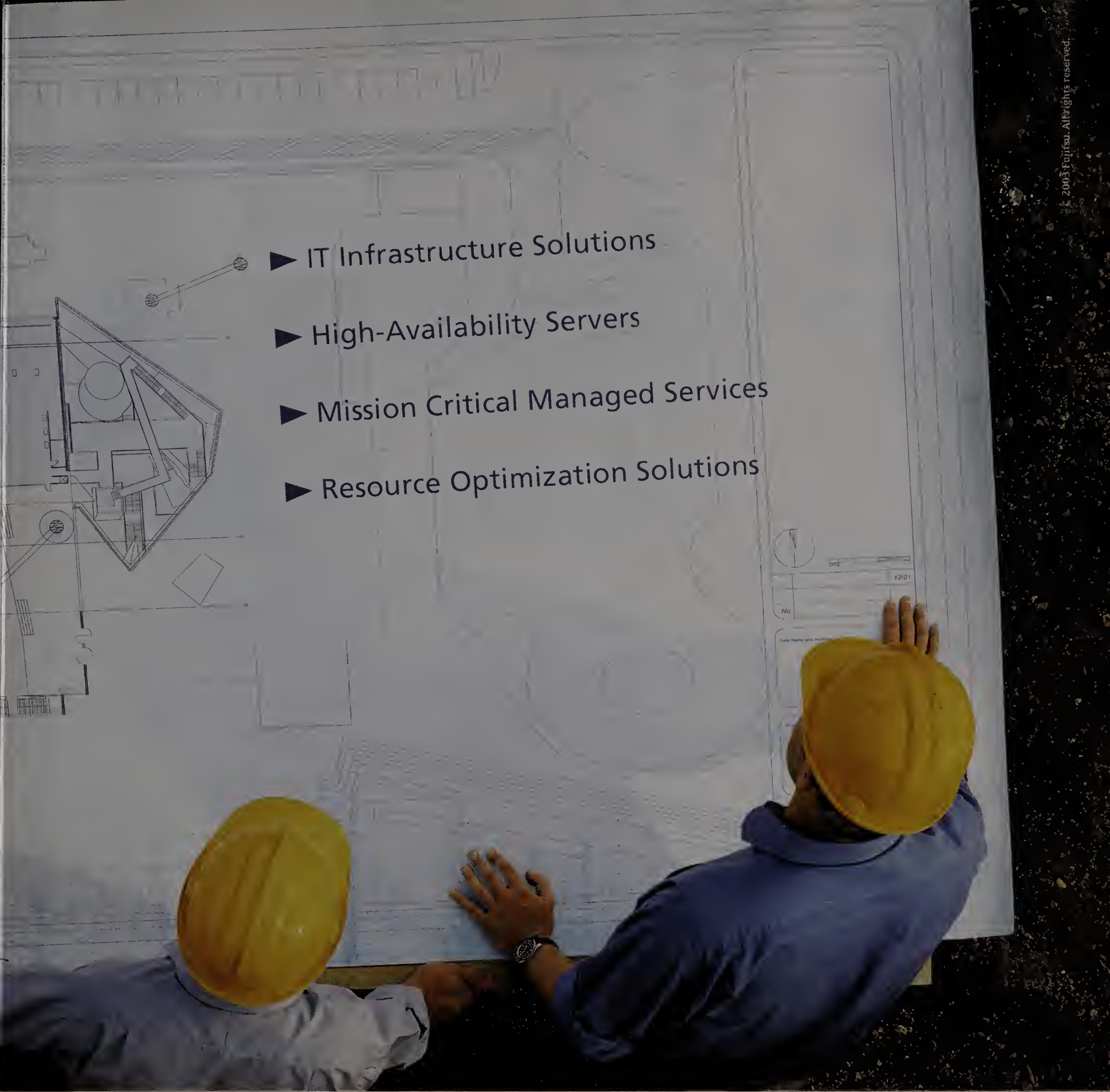
- 
- ▶ Value Management
  - ▶ Business Intelligence & Analytics
  - ▶ IT Portfolio Management
  - ▶ Application Outsourcing
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  - ▶ IT Effectiveness

ROI/Value Management

## BUILD MORE BUSINESS VALUE INTO YOUR IT INVESTMENTS

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## Special Issue *continued*

### **HEALTH DECISIONS** **The Little Company** **That Could | 68**

Fed up with the manual process of running clinical trials, Health Decisions takes a chance on a new way of doing business—and succeeds in an industry of large competitors unwilling to change.

*By Ben Worthen*

### **SECURITIES AND** **EXCHANGE COMMISSION** **Full Disclosure | 74**

The electronic financial disclosure system known as Edgar streamlines regulatory compliance and information access for multiple constituencies. It transforms the interface among the investor, stock share issuer and the SEC. *By Megan Santosus*

### **PROCESS** **Value Judgments | 80**

Enterprise Value Award winners must run a review board gauntlet and pass muster with five picky CIOs before they can claim the enterprise value mantel.

*By Richard Pastore*

## Columns

### **REALITY BYTES** **The Kindness of Strangers | 36**

Africa today seems full of people eager to give our author millions. Isn't that nice?

*By Todd Datz*



**"If one emerges as an Enterprise Value Award winner, it's a remarkable accomplishment. The winners are people we can learn from and emulate."**

—Enterprise Value Awards judge John Glaser Page 80

## EMERGING TECHNOLOGY | 86

### Net Talk Gets Real

It is widely accepted that sooner or later VoIP will sweep the board, offering the promises of simpler management, lower costs and voice-application integration. The analysts and vendors predict it. However, at least for the moment, old-fashioned switched connection telephony is pretty good at its core mission: quality calls at high levels of reliability. *By Fred Hapgood*



## Sections

### **TRENDLINES | 24**

Cyberterrorist threats; Palm is reaching out; John Hagel on Web services; Machiavellian managers. *And more*

### **BY THE NUMBERS | 28**

Save time and money: Outsource software implementation.

### **ON THE MOVE | 32**

CIOs on the go—see where your IT peers are working now.

### **EMERGING TECHNOLOGY | 86**

Voice over IP isn't an if; it's a when.

*By Fred Hapgood*

### **COOL PRODUCT | 90**

Enterprise legacy app integration.

### **UNDER DEVELOPMENT | 92**

An environmentally friendly way to mine for gold.

### **COMPANY TO WATCH | 94**

Deersoft moves from open-source roots to enterprise spam blocking.

## In Every Issue

### **INBOX | 18**

Reader feedback

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### **EXECUTIVE SUMMARY | 100**

Abstracts of all the feature stories found in this issue.





## WHY NOT TURN YOUR DATA CENTER INTO A PROFIT CENTER?

A data center doesn't have to be a black hole, where dollar bills disappear and are never seen again. Servers don't have to be deployed in ways that utilize less than 20% of their computing capacity. Every application doesn't have to exist on its own dedicated server. And every server doesn't need three people to manage it.

Companies shouldn't have to spend 80% of their data center budgets on administration. Millions of dollars "invested" in operations, consulting and services that supposedly make the data center work.

At Sun, we're not simply trying to "manage" the complexity. Or more precisely, to get rich off the complexity. Our goal is to eliminate it. To innovate new services, software and systems that drive costs down while dramatically reducing complexity.

That's why Corporate Express turned to Sun, a move that saved \$10,000 per day in operating costs by consolidating 43 servers onto two Sun Enterprise™ 10000 servers. And why other companies are using Sun's mainframe rehosting solutions to save up to 70% of their annual IT operating costs.

These companies rely on Sun for cost-reduction strategies that ultimately lead to more streamlined, easier-to-manage data centers. Data centers that free their IT staff from the daily management of individual servers, and allow them to refocus on the task of turning information and network infrastructure into a strategic advantage.

If your data center is sucking more money from the bottom line than it's adding to the top line, it's time to turn things around. It's time to reestablish your data center as a competitive weapon. As the means by which you improve customer experiences and relationships, deliver new loyalty-driving services and maximize efficiencies throughout your company.

In short, it's time to reinvent the data center. And the first step is to call Sun.

Register for a free on-site consolidation assessment from  
the Sun Services team at **SUN.COM/WHYNOT**



SYSTEMS

SOFTWARE

SERVICES

STORAGE







|                                                                                                                                                                                                                                                                                       |                 |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SAY THE BUSIEST CONTACT CENTER at Dollar Rent A Car crashes and is fixed remotely before a single reservation is dropped. Before anyone at Dollar is even aware of a problem. Did a problem ever exist? In the state of Avaya, our Expert Systems <sup>SM</sup> remote monitoring and |                 | maintenance solutions resolve 96% of all alarms remotely. Nobody has our patented leading-edge diagnostic tools, including proactive trouble resolution. And our Avaya Global Services professionals bring a single point of accountability to multi-vendor communication environments. That's | reassuring when your company runs a fleet of 140,000 rental cars at 400 worldwide locations, with a reputation for superior customer service. See why no one else comes remotely close to maximizing your network investment at <a href="http://avaya.com/services">avaya.com/services</a> . Or call <b>866-GO AVAYA</b> today. |
| IP Telephony                                                                                                                                                                                                                                                                          | Contact Centers | Unified Communication                                                                                                                                                                                                                                                                          | Services                                                                                                                                                                                                                                                                                                                        |

# AVAYA REMOTE MONITORING FIXES *Dollar Rent A Car's* NETWORK CRASH *before anyone hears an alarm.*

*Kind of like that tree that falls in the forest.*





## WEB >connections

Interactive features from February 1 to February 14

### Ask the Sources

Representatives from each of this year's five **Enterprise Value Award** winners will be online for the next two weeks to answer your enterprising questions. To post a question and read responses, go to [www2.cio.com/ask/source](http://www2.cio.com/ask/source).



From the **University of Illinois Medical Center**, Associate Vice Chancellor Joy Keeler (see **Off the Charts**, Page 46)



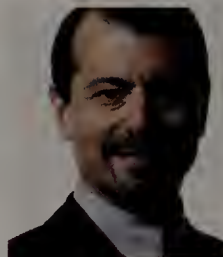
From the **Wharton School of the University of Pennsylvania**, CIO Gerry McCartney (see **Best in Class**, Page 52)



From **Con-Way Transportation Services**, VP of Information Services Jacquelyn Barretta (see **Cruise Control**, Page 60)



From **Health Decisions**, CTO Rick Farris (see **The Little Company That Could**, Page 68)



From the **Securities and Exchange Commission**, Edgar Project Manager Richard Heroux (see **Full Disclosure**, Page 74)

### Honorable Mentions Online

Belo Interactive's goal to create an online content management system was achieved largely through leveraging legacy systems. MasterCard International saw value in

extending its online services to its member banks as well. Read **All the News That Fits and Online Services...Priceless** at [www.cio.com/printlinks](http://www.cio.com/printlinks).

Find links to the stories mentioned above in the **WEB CONNECTIONS** box at [www.cio.com](http://www.cio.com).

### Peer Resources from Our Sister Publications

#### From CSO MAGAZINE

You can't be on the fence when it comes to cyberterrorism (see **Threats Won't Make the Sky Fall**, Trendlines, Page 24). Those who know where they stand might want to check out the new terrorism insurance bill—read **Footing the Bill**. [www.csoonline.com](http://www.csoonline.com)

#### From DARWINMAG.COM

Voice over IP (VoIP) isn't future-talk—it's here and now (see **Net Talk Gets Real**, Emerging Technology, Page 86). Need to get your nontechnology colleagues up to VoIP speed? Send them the latest word with the **Darwin Executive Guide to Voice Over IP**. [www.darwinmag.com](http://www.darwinmag.com)

### The CIO Best Practice Exchange

Participants in our members-only online network of CIOs are asking questions and receiving the kind of time-tested advice that only other CIOs can give. Here's what your peers are discussing:

**"I'm getting pressure from my CEO to measure the productivity of our developers. Have any of you used the function point method?"**

**"We are beginning a selection process for a new budgeting and forecasting software toolkit. Can anyone recommend a good package?"**

**"We are developing a remote access policy. We'd like to learn what others are doing in this area and what tools you have employed."**

If you are a senior IT executive at a midsize or large organization and would like to join the CIO Best Practice Exchange, go online to [exchange.cio.com](http://exchange.cio.com).

### Our Daily Web

**MONDAY Tech Tact** Technology Editor Christopher Lindquist covers what's coming.

**TUESDAY Quick Poll** Read what CIOs think about current IT issues.

**WEDNESDAY Metrics** Web Writer Jon Surmacz makes sense of the numbers.

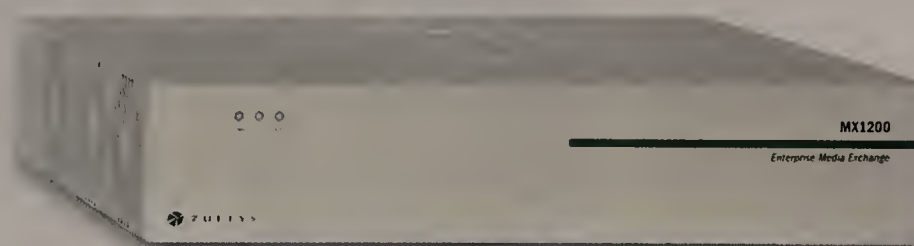
**THURSDAY Sound Off** Web Editorial Director Art Jahnke opines on ethical dilemmas.

**FRIDAY The Blg Picture** Charts and graphs worth a thousand words.



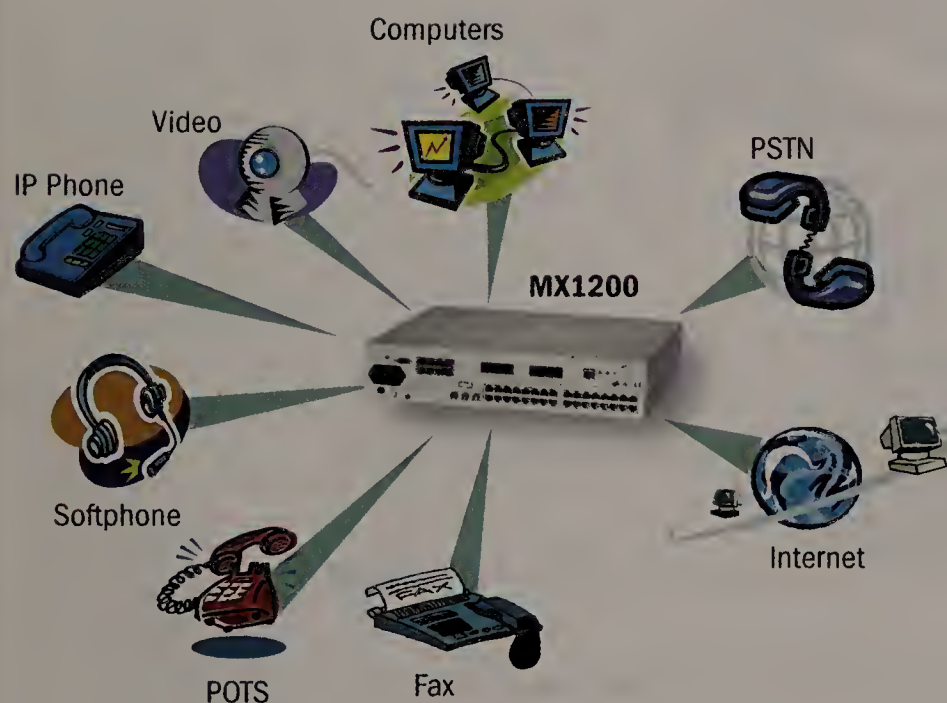
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Once upon a time,  
there was a company with a terrible  
problem: their servers just kept crashing.  
So they bought Magic Server Pixie Dust. Simply  
sprinkle on the Pixie Dust, and crashed servers would  
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never go down. Servers would run themselves. Repair themselves. *On demand*.  
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problems. It seemed almost too good to be true. The truth is, it didn't exist.

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they happen. To also protect themselves and manage themselves in ways never before  
imagined. This is the kind of autonomic, *on demand* technology IBM is building  
for the new "always on" environment. Not Magic Pixie Dust. Visit **ibm.com/ondemand**





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# InBox

Reader Feedback

## WHAT'S MORE VALUABLE: PROFITS OR PEOPLE?

The Net Gains column "Create Value from Values" [Nov. 15, 2002, available at [www.cio.com/printlinks](http://www.cio.com/printlinks)] promoted a number of common misconceptions that should be clarified. First, the author asserts that recent criminal activities were done in the pursuit of corporate profits. Did companies such as Enron or WorldCom profit from their misdeeds? Indeed, one could better argue that the regrettable incidents would not have occurred if the companies had been more focused on making profits.

Second, the article suggests businesses see themselves as having a higher purpose than profit. Businesses are no such entity. Businesses are groups of individuals aligned for a common purpose—to make a profit. If some of the same individuals seek to get together on social ventures, they are free to form nonprofits, but they should not hijack a business to suit their nonbusiness goals.

The quote "You have a right to perform your prescribed duty, but you are not entitled to the fruits of your actions" belongs in *The Communist Manifesto*, not in a civilized publication. The greater amount of the fruits of one's labor that one is allowed to keep, the higher the standard of living for all.

In summary, there is no conflict—no balance to strike—between value and values. It is only when one supercedes the quest for corporate profit that one opens the door to the question, Who wants to do what with the money that would/should go to the shareholders? No matter how noble the intention, it is a question that is inappropriate to ask.

Eric Kassan

Software Development Manager  
Chase Credit Systems  
Woodland Hills, Calif.  
[ekassan@useyourmind.com](mailto:ekassan@useyourmind.com)

*The column's author, Mohanbir Sawhney responds: The criminal misdeeds at Enron and WorldCom were committed in the pursuit of self-enrichment and the greed of executives. When individuals lose their moral anchors, so do the companies they work for. After all, as the*

*reader himself states, "businesses are groups of individuals aligned for a common purpose." To which I might add, "...and with a common set of values." I was simply suggesting that businesses would do better (and be more profitable) if they tapped into the full potential of their employees, instead of seeing them as cogs in a wheel. The quote from the Bhagavad Gita needs to be understood as the principle of focusing on doing your duty and letting the rewards come naturally as an inevitable byproduct. It does not mean that rewards aren't important or that they should be doled out equally across society, following some Communist ethic. I might add that the Bhagavad Gita is the bible for Hindus—a text that most people would consider more "civilized" than any business magazine. I stand by my assertion—if businesses value profits as the only goal above all other goals, they will be tempted to use any means necessary to make money.*

Your Net Gains column was quite a good overview of how a good company looks at various issues other than just profits. However, one area that I

thought was overlooked is the competition between those aspects and the actual owners of the company—the shareholders. All the shareholders demand are increased dividends, earnings and stock value. This is dichotomous to what you write about, which is, effectively, a humanized workplace. And when certain people in the company are worth up to 250 times or more than one person doing the work at the company, a real problem exists in the vacuum of corporate culture. We really need to change the paradigm in business culture and turn it on its head to empower the appropriate people through a process of building trust from within, not from without.

Mark Boyden

Information Horticulturalist

Athens Group

Austin, Texas

[mark.boyden@athensgroup.com](mailto:mark.boyden@athensgroup.com)



## WHAT DO YOU THINK?

Send your thoughts and feedback to [letters@cio.com](mailto:letters@cio.com). Letters may be edited for length or clarity.



A woman with blonde hair, wearing a light-colored jacket and a patterned scarf, is running towards the left. She is carrying a laptop under her arm. In the background, a military-style helicopter is landing or taking off in a field. The scene is set in a dry, grassy field under a cloudy sky.

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**Communications Queen.**

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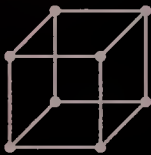
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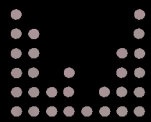
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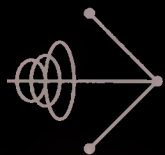
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# trendlines

the **NEW** the **HOT** the **UNEXPECTED**

Edited by Lafe Low and Michael Goldberg

## SECURITY

### Threats Won't Make the Sky Fall

WHEN IT COMES TO THREATS of cyberterrorism and attempts to wreak havoc with the world's computer networks, there are two schools of thought.

There's the Chicken Little school that says the sky is falling: An attack on the Internet, in conjunction with a physical attack, constitutes a terrorist act; physical installations such as utilities show a real vulnerability in their communications networks.

Then there's the Crying Wolf camp, which discounts such warnings: Whatever computing infrastructure exists that would create terror if it were down (utilities, nuclear plants, financial markets) isn't all that vulnerable to attack.

**E-Bookies** As NFL fans and the two football finalists geared up for Super Bowl XXXVII on Jan. 26, in San Diego, so too were online gambling sites. It's a safe bet that a good portion of the Internet gambling industry's 2003 revenue (about \$5 billion) was at stake.

While online gambling is illegal in the United States, a simple Web search yields thousands of gambling sites. A December 2002 GAO report pegs the number of e-gaming websites at 1,800, many based in the Caribbean. These sites constantly update their offerings for the gambling public. One such update is "in-progress betting," a way for online gamblers to place hundreds of bets during the game, and that's hundreds more ways for fools and their money to be parted.

—Tom Waigum

You might believe a version of either, but you can't believe both. And chances are, you're not on the fence.

Cyberterrorism has been held up as the next battlefront (see "The Truth About Cyberterrorism" at [www.cio.com/printlinks](http://www.cio.com/printlinks)).

Now come the not-so-veiled threats from two men sympathetic to the al-Qaida terror network, both speaking recently in the pages of *Computerworld* about their desire to use IT to harm the United States and its allies. (The publishers of *Computerworld* and *CIO* share the same parent company.)

One, known as Melhacker, threatened to launch a "three-in-one megaworm" if and when the United States attacks Iraq. He even gave a code name for the virus, Scezda, and announced the basic structure of the thing (which is not a very good hacker technique; less warning is better from that viewpoint). The second man, Sheikh Omar Bakri Muhammad, described as a London-based Islamic fundamentalist "with known ties to Osama bin Laden," said that "in a matter of time you will see attacks on the stock market."

These are explicit threats, make



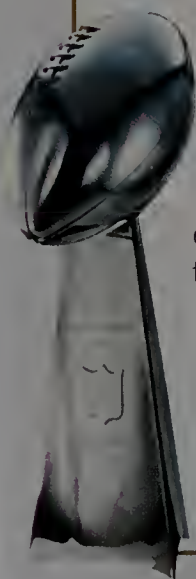
Sheikh Omar Bakri Muhammad, an Islamic fundamentalist in London, warns of cyberattacks on U.S. targets such as the stock market.

no mistake. But while they generate talk about how serious they are, they are not really new. CIOs and other IT executives would be wise to remain focused on what a specific threat means to their organization so that they can address any vulnerabilities that may exist. You don't need to hear the words of a terror threat to sustain such a focus.

Take the recent, highly publicized attack on the Internet's root domain name system (DNS) servers. In that attack, an unknown hacker flooded the Internet's main servers that translate URLs into their numerical IP addresses. The attempt was to stop the Internet from working. The attack was largely unsuccessful because of DNS's distributed architecture.

Both camps got their say. "This is a success story for the good guys," says Bruce Schneier, founder of Counterpane Internet Security and

Continued on Page 26







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## VENDOR RELATIONSHIPS

# Palm's Reaching Out

**NEW MANAGEMENT.** New product lines. New strategic direction. It's no secret that Palm Solutions Group is working hard to turn around its fortunes. The company's recent line of Tungsten PDAs demonstrates a renewed focus on cutting-edge technology. New business-oriented software, including server-based wireless e-mail tools, have finally dragged Palm out of the "one PDA, one desktop" era. Now even Palm's own CIO, Marina Levinson, is getting in on the act.

Levinson's group heads up CIO Mindshare events intended to let other CIOs meet and discuss mobile and wireless issues. The inaugural meeting happened last year, but Palm says it hopes to hold the events about every six months. The meetings are just the latest attempt by Palm to build stronger ties to its enterprise customers—a group that had reason to feel somewhat ignored during Palm's early years.

Palm has been around since 1996, yet it wasn't until the very end of 1998 that it held its first Palm Advisory Council meeting to tap enterprise IT managers for ideas. Facing increased competition from Palm

OS-based devices built by the likes of Sony and Handspring, as well as an onslaught of Microsoft-powered PocketPC PDAs, Palm finally recognized the need to grow up from its grassroots origins and become an enterprise partner. So starting in 2001, with the Advisory Council and specific events for CIOs, meetings doubled in frequency.

It appears to be working, if advisory council member Jeff Roggensack's experience is any indication. Roggensack, senior vice president and CIO of Rehab-Care Group, a St. Louis-based provider of temporary health-care staffing and program management, attended the Mindshare event. While Roggensack does get to offer Palm his suggestions, he says the biggest benefit so far has come from networking. Roggensack found another IT manager at the first meeting who was working with the same remote synchronization vendor, and the two have compared notes ever since.

Roggensack says that the council and other Palm outreach programs aren't guarantees that he won't switch platforms later—but they certainly help. "I want the vendors I choose to be successful," he says. "If they can provide me some support through both the networking of the Palm Advisory Council and other meetings with them, then those are good things that help me with the relationship."

—Christopher Lindquist



## SECURITY

## New FOIA Rules

**FOR YEARS**, the federal government has sought the private sector's help in protecting the nation's critical infrastructure. In response, corporate executives have sought assurances that information they shared with the government would stay hidden as it is not subject to the Freedom of Information Act (FOIA).

Now they have that assurance. The law creating the Department of Homeland Security signed by President Bush last November contains a provision that protects information given to the government that pertains to "the security of critical infrastructure and protected systems, analysis, warning, interdependency study, recovery, reconstitution or other informational purpose." The provision means that not only is such information exempt from FOIA requests from the public, but it also stipulates that the government won't use the information in any civil action without prior written consent from the source.

There is a catch: Companies or people that share such information must give written notice that it falls under the protections of this law, the Critical Infrastructure Information Act of 2002.

—Sarah D. Scalet

## Threats Won't Make the Sky Fall

Continued from Page 24

a Crying Wolf camper. "As terrorism goes, this isn't it."

There's still room for Chicken Little, though. John Snyder, vice president of IT at Bretheren Mutual Insurance Company in Hagerstown, Md., says plainly on the DNS attack and on cyberterrorism in general: "Let's take the position that the sky is falling so we're prepared for the worst."

Dan Verton, the *Computerworld* reporter who talked to the would-be cyberterrorists, says the Crying Wolf camp is in denial. "The Internet security community, particularly in the private sector, has a real problem on its hands," he adds.

If that's the case, that poses a challenge. In a recent interview at CIO's offices, federal cybersecurity czar Richard Clarke reiterated that the nation is counting on people in the private sector to combat threats to its critical infrastructure. But before they can do that, the wolves and the chickens are going to have to gather round the fence so that they can talk.

—Scott Berinato





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# By the Numbers

By Lorraine Cosgrove Ware

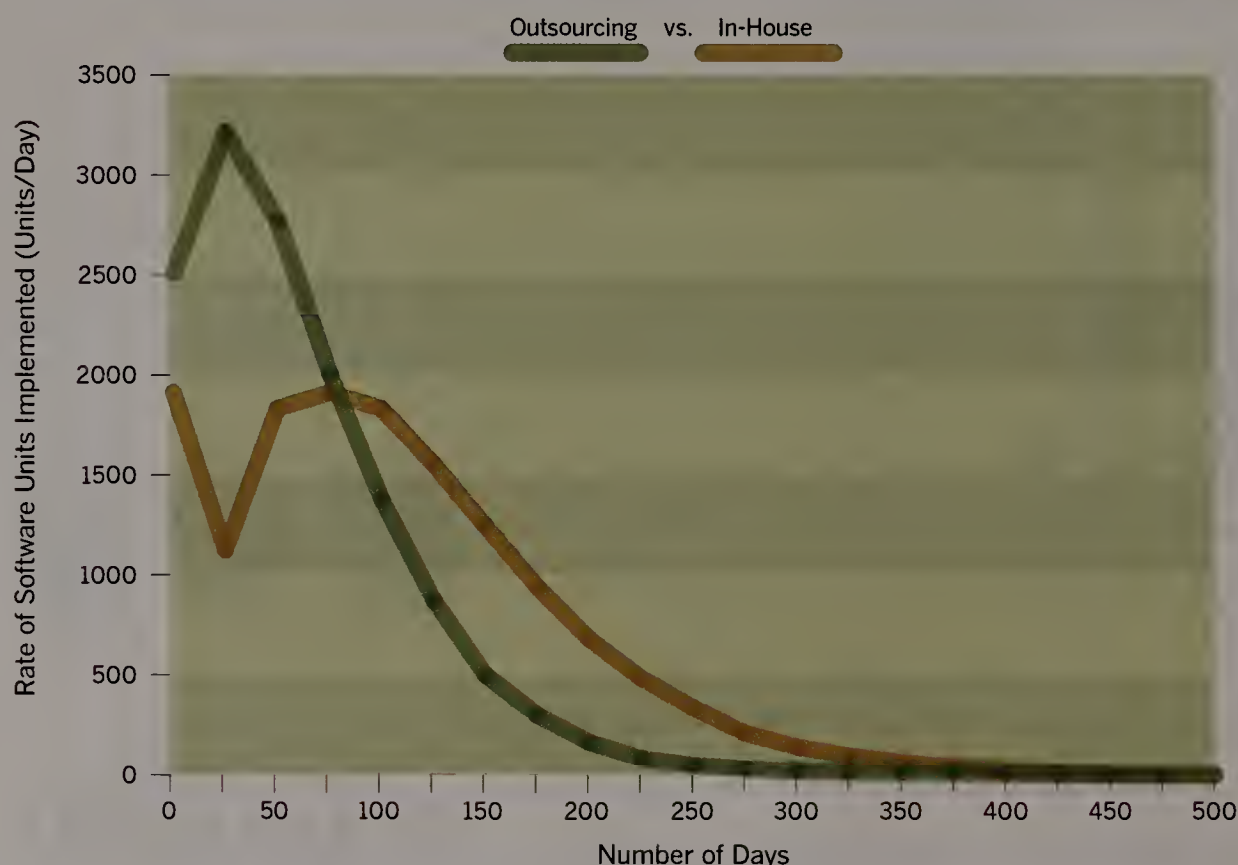
## Save Time and Money: Outsource Software Implementation

**COMPANIES THAT OUTSOURCE** packaged-software implementations can benefit from shorter time to implementation and lower costs as opposed to taking on these tasks in-house. IDC estimates that the time to implement an application can be reduced by 43 percent if performed by an outsourcer because of its superior experience in an application area and more effective cost and resource management. "In the short term, hiring additional personnel reduces productivity of existing employees due to training and assimilation," says IDC Program Manager Amy Mizoras. "When you outsource,

the application outsourcer absorbs these risks and can maintain a steady level of productivity." While attrition of skilled IT workers can be a problem for client companies and outsourcers alike, outsourcing places this risk on the provider, rather than on your organization. In our Nov. 15, 2002, feature "Less Pain More Gain," we cited an AMR study that found that companies that hand over responsibility for their upgrade projects experience a cost increase due to outsourcers taking time and money to first understand their business. This IDC study agrees, but it found that the initial cost eventually levels out.

### The Outsourcing Advantage

Outsourcing software implementation takes less time and encounters fewer setbacks than implementing in-house. As a result, when you outsource, the rate of software units implemented is greater and the time needed to implement those units is reduced.



SOURCE: IDC (A SISTER COMPANY TO CIO'S PUBLISHER, CXO MEDIA) DOCUMENT #27743.  
"IN-HOUSE VERSUS OUTSOURCED: A SYSTEMS DYNAMIC COMPARISON"

### Best Practices

**Go with an expert.** Make sure the outsourcer you select has expertise in the particular application you're implementing. "If the outsourcer has less experience in an applications area than the customer, there is little benefit to outsourcing," says IDC's Amy Mizoras.

**Outsource incrementally.** Since most organizations have already made significant investments in IT during the past few years, outsourcing parts of the implementation and operation process can still provide benefits. "Pick a niche area like time-and-expense reporting or a self-service HR application—areas that have high success rates—to get buy-in, then expand your outsourcing," Mizoras says.

**Get references from peer companies.** Select an outsourcer that has experience with similar situations to yours—company size, implementation approach (incremental versus entire project) and application type (mission critical or not). This ensures that the outsourcer will understand your needs and in many cases can suggest other applications and features helpful to your organization.

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Q &amp; A

# John Hagel on Web Services and You

**JOHN HAGEL**, the author of *Out of the Box: Strategies for Achieving Profits Today and Growth Tomorrow Through Web Services*, argues that managers at the edges of an enterprise, who are under intense pressure to reduce costs, see Web services as an easy way to integrate with business partners. However, as Hagel recently told CIO Staff Writer Ben Worthen, the CIO is under equal pressure to control costs. And that can put the CIO in the uncomfortable position of saying no to technology.

**CIO:** Do business managers have the technical know-how to create Web services and access the databases that are needed for meaningful collaboration?

**HAGEL:** A business manager confronted with a particular problem has somehow heard about Web services and is looking for ways to implement it and make sure that it is actually appropriate for the company. And typically they find a lot of ambivalence from the IT department within their own enterprise. Basically they are launching what I would describe as a skunk works initiative where they get sympathetic people in the IT department who are beneath the radar screen to help them drive the implementation. But, in large part, they try to keep a low profile since it is relatively controversial. That is one of the reasons that we don't hear about these initiatives, since the executives who are driving them aren't looking for publicity. They fear if they get too much attention, they will get shut down.

This speaks to another argument of yours, that CIOs are often the greatest impediment to the adoption of a new technology.

Not all CIOs. Part of it has to do with very legitimate concerns about the early stage of the technology. You have to look at the incentive structure that CIOs operate under. This is a gross generalization, but most CIOs aren't going to have rewards for major new business initiatives that drive value to the company. But they have a high and increasing risk of being fired if projects fail.

Isn't that an antiquated view of the CIO role? A lot of CIOs have business backgrounds and view themselves as business leaders. Shouldn't that motivate them to want to help the business?

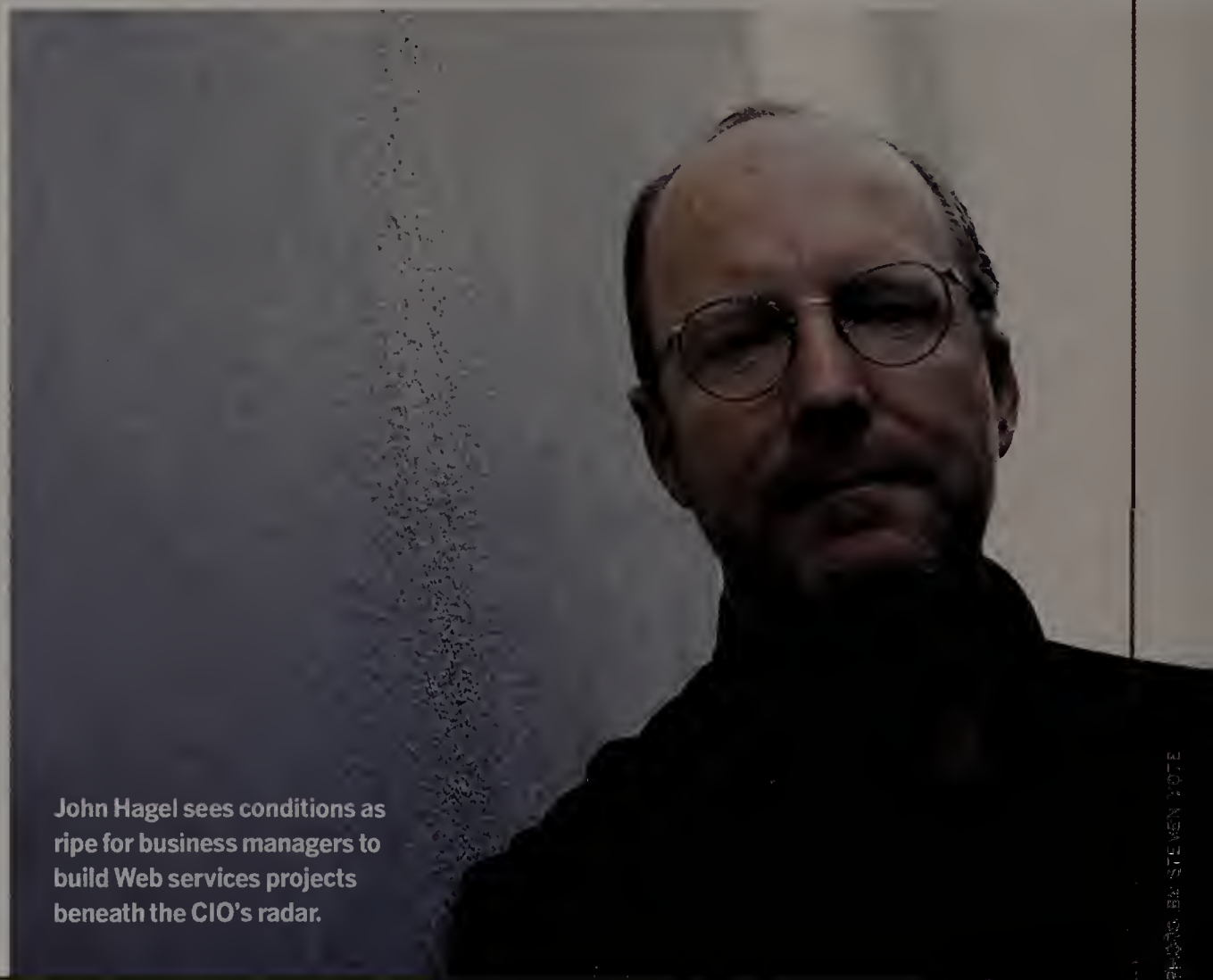
I do think there is a rather perverse incentive structure that has emerged over time and...it creates conservatism on the part of the CIO. I think a related piece is that CIOs in many cases were primary drivers of ERP and investments in websites, and

as a part of the general backlash against that kind of spending, there is a growing skepticism about whether IT will be able to deliver value.

CIOs argue that Web services standards, especially security, are either immature or simply don't exist. Isn't this a strong argument for caution when it comes to deploying Web services?

I think these concerns are completely legitimate. At the end of the day, this is about trade-offs. If I can get significant near-term business benefit, I may be willing to take on a higher level of risk than if the return is speculative or long term. And I think that is the trade-off that line managers are making, partly from ignorance.

**CIO.COM** Read the full interview online. Look for **CONVERSATION WITH JOHN HAGEL** in the Web Connections box on our homepage, or go to [www.cio.com/printlinks](http://www.cio.com/printlinks).



John Hagel sees conditions as ripe for business managers to build Web services projects beneath the CIO's radar.

PHOTO BY STEVEN VOTE





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# On the Move

By Meridith Levinson

## Here Come the Chief Everything Officers

THESE ARE THE DAYS of doing more with less. Companies are increasingly asking their CIOs to assume additional responsibilities. **James D. Nikolai** (left), CIO of Jefferies & Co., was recently



appointed as chief administrative officer. Nikolai will still spearhead technology initiatives at the New York City-based investment bank (where Jeff Bezos worked before starting Amazon.com). Now he

will also lead the company's clearing, execution and securities lending businesses.

Harmon AutoGlass in Minneapolis has also hired a double-duty CIO. **Robert Bishop** was recently brought on board to fill both the CIO and CFO positions.

**Timothy Wright** continues to wear both the CIO and CTO hats; he moved from Waltham, Mass.-based Terra Lycos to Geac Computer in Markham, Ontario, in January. Somehow, he also had time to pen the Jan. 15, 2003, Peer to Peer column for *CIO* titled "Changing Horses in Midstream." Sounds prescient.

We can only hope that wearing two hats entitles these three hard-working gents to earn twice as much.

### Doin' the IT Shuffle

Companies that aren't piling extra work on their CIOs are instead shuffling the decks within their IT leadership in an



effort to lower costs. At New York City-based insurance giant MetLife, three IT executives in its operations and technology unit have taken on new roles (to read more about MetLife's IT operations, see

"Economies of Scale," available at [www.cio.com/printlinks](http://www.cio.com/printlinks)). **Peggy Fechtmann** (bottom left), who previously served as CIO for corporate systems, is now senior vice president in charge of individual business operations. **Georgette Piligian**, who had been leading e-business efforts within the company's institutional IT organization, replaces Fechtmann. Those two assumed their new roles last Novem-

ber. Then last December, **Larry Blakeman** moved from vice president of client relations to CIO of MetLife's Auto & Home division.

### Not for Naught

Amidst the continued economic doom and gloom, hard work still pays off. **Steve Caron**, director of IT at Memphis, Tenn.-based property management company ResortQuest International, has been promoted to senior vice president and CIO. Tower Records, the Sacramento, Calif.-based music retailer, bumped its CIO **Bill Baumann** up to senior vice president of technology and supply chain.

## PROFILE: HARRAH'S DOUBLES DOWN FOR I.T.

**IT'S OFFICIAL.** Last month, **Tim Stanley** (right) took over as CIO of Las Vegas-based casino company Harrah's Entertainment. The 36-year-old Stanley continues to report to **John Boushy**, who remains senior vice president of operations, products and services, a position he has held since February 1999. *CIO* caught up with Boushy and Stanley to get the scoop on their new roles.



**CIO: John, how does this announcement change your role?**

**BOUSHY:** It's galvanized me around certain areas of our business—in particular, slots and design and construction. I'm looking at how we can merchandise our slot machines better on the floor. It's amazing how important where you put the slot [machine] is, where you put the lights, the color of the lights, the sound and ambient noise on the floor. If we merchandise them well, they contribute very powerfully [to the bottom line], to improved customer experiences and greater customer loyalty.

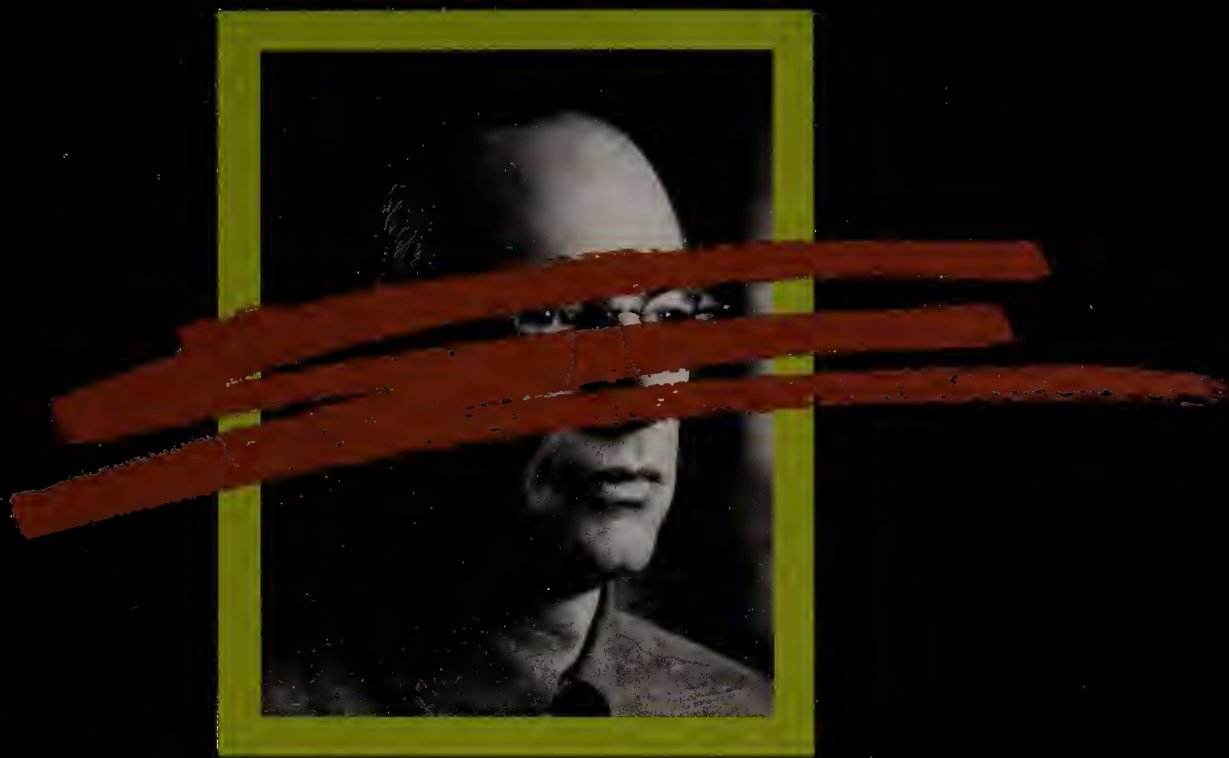
**Tim, what are you going to do differently from John?**

**STANLEY:** I see assuming the CIO role as evolutionary as opposed to revolutionary. As I've had an opportunity to work in a variety of capacities with John, I've learned and adopted a number of his ideas and approaches. John has a tremendous legacy here. He and his team have put in some outstanding systems and programs that I'll take to the next level.

**What is the next level?**

**STANLEY:** It's the idea of the active enterprise. We want to make our interactions with customers—whether they take place on the phone, on our website or at a slot machine—more dynamic and proactive. We're taking what we've done with our data warehouse, operational systems and our CRM environment and integrating them in an active environment, so when someone checks in to a hotel, we know exactly what needs to take place on the property to provide them with a seamless experience.





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MANAGEMENT STRATEGIES

# The Making of a Machiavellian Manager

**MANY CIOs THINK** of corporate politics as an unnecessary evil. This can be a costly career mistake, according to the creators of a two-day workshop called "The Politics of IT Project Management." The workshop aims to teach IT leaders how to be politically savvy as they build relationships, says Thomas McDonough, client services manager for the Bedford, N.H.-based management consultancy Ouellette & Associates that runs the workshop.

Kevin Copeland, manager of business relationships and Enterprise Technology Services project office at National Life Insurance in Montpelier, Vt., says the workshop changed his strategic approach to his job. "I have tended to look at politics in a negative way," he says. "The [workshop] agenda made it obvious that there are ways to use politics to get a desired outcome and to keep unity on [IT project] teams."

The workshop includes a quiz, where students test their political proficiency. A sampling of the quiz questions follows:

|                                                                                                                         | strongly agree |   | sometimes agree |   | never agree |
|-------------------------------------------------------------------------------------------------------------------------|----------------|---|-----------------|---|-------------|
| 1 If I'm fair and honest, others will treat me the same way.                                                            | 1              | 2 | 3               | 4 | 5           |
| 2 I have too much work to do, so I don't have time for politics.                                                        | 1              | 2 | 3               | 4 | 5           |
| 3 It's acceptable to argue with a client (or user) to make a point.                                                     | 1              | 2 | 3               | 4 | 5           |
| 4 In the past, IT hasn't delivered everything we've promised, but that shouldn't have any effect on my current project. | 1              | 2 | 3               | 4 | 5           |
| 5 I never listen to or engage in gossip.                                                                                | 1              | 2 | 3               | 4 | 5           |

## SCORE

The higher your score, the higher your degree of political savviness.

**5-12 points:** You're a political hibernator, someone who dislikes and avoids political involvement.

**13-22 points:** You're a political survivor, someone who recognizes politics is necessary, has a loosely formed network of contacts and is occasionally proactive.

**22-25 points:** You're a political savant—confident, effective, someone who understands and excels in the political environment and stays well-connected at all levels of an organization. —Mindy Blodgett

## This Date in IT History

2

In **1988**, the **SEC** openly blames computer trading as a major cause for Black Monday, the colossal 22.6 percent stock market crash on Oct. 19, 1987. Analysts point the finger at automated computer systems programmed to order large stock trades triggered by market trends. Two days later, the New York Stock Exchange drafts stringent rules for electronic trades.

3



IBM loosens its tie in **1995**. Newly installed Chairman **Lou Gerstner**, the former chief at R.J.R. Nabisco,

undoes decades of IBM policy by announcing that workers no longer have to wear the long-standing company uniform (white shirt, black tie) to work.



**Johannes Gutenberg**, the father of modern-day book publishing, dies in **1468**. Almost 20 years

earlier, Gutenberg turned the world upside down by creating the movable type printing press. Books were then produced at a more rapid pace, and texts once stored solely in libraries or universities could now be found in the home of the common man.

15

After a two-year FBI manhunt, hacker extraordinaire **Kevin Mitnick** is arrested in Raleigh, N.C., in **1995**. Mitnick faces a 23-count federal indictment before a plea bargain drops all but one of the charges against him. He ends up serving eight months in jail for illegally using access numbers to break into several computers. It's his third trip to prison.

17

Go humans! After losing the first game just a week earlier, chess



grandmaster **Garry Kasparov** comes back to defeat **Deep Blue**, IBM's chess-playing super-

computer, and end the six-game match in **1996**. Kasparov won three games, Deep Blue won one, and there were two draws. IBM's king-capturing Kasparov-killer failed this time but was tinkered with and wheeled in one year later when it officially beat the chess wiz. This marked the first time a machine checkmated a human player of such caliber in a match setting.

19



President **Ronald Reagan** awards the **first National Medal of**

**Technology** to the two Steves—Wozniak and Jobs—in **1985** for their work developing the personal computer. Steve and Steve had founded Apple in 1976, which grew out of Wozniak's garage, and by 1979 it had sprouted into a billion-dollar company.

22

**Heinrich Hertz** is born in Hamburg, Germany, in **1857**. Hertz, a German physics professor at Karlsruhe



Polytechnic, used brass knobs and an induction coil to send and receive radio waves in 1887, which laid the groundwork for the development of the wireless telegraph, radio and television. The unit of frequency of a radio wave is called a hertz in his honor.

—Daniel J. Horgan

SOURCES: THE HISTORY CHANNEL, UNIVERSITY OF MELBOURNE, WEBSTER UNIVERSITY, TECHNOLOGY ADMINISTRATION, ADVENTURES IN CYBERSOUND, GUTENBERG.DE, IBM



All those worried about  
security breaches through  
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## Technology Risk

Wireless networks offer businesses several advantages. Increased mobility, design flexibility, lower costs. But as with most new technologies, design focuses on functionality – not risk. Wireless technologies do not have the physical access restrictions used in traditional wired environments. They make it possible for someone in the lobby or across the street to have access to a network carrying sensitive corporate data, client information, or trade secrets.

Are your wireless access points configured with adequate security? Has your business taken steps to prevent hackers from exploiting your information? Do you know your vulnerabilities? "War driving." "Net stumbling." "War chalking." "LAN jacking."

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# Reality Bytes

A Cold Look at Hot Trends

## The Kindness of Strangers

Africa today seems full of people eager to give our author millions. Isn't that nice?

BY TODD DATZ

**LIKE MOST OF THE GENERAL POPULATION** (but unlike those CEOs who were lucky enough to unload their stock options just before their company's earnings took a dive), this past year has put a dent in my retirement funds bigger than the one next to the headlight on my '93 Prizm. And believe me, that's a pretty big dent. It didn't take me long (I'm lying; I procrastinated for over a year) to put my tail between my legs and change my asset allocation from a "Movin' on up" 80 percent stocks/20 percent bonds ratio to a "I'm petrified" 40/60 split.

Having said that, I thank my lucky stars I have one wild card that the depressing Dow Jones Index can't touch. For at least a couple of years now, I've been receiving personal, confidential e-mails from a number of different potential benefactors, all who happen, coincidentally, to live in Africa. Each of them has offered to cut me in on a multimillion dollar bounty that has, in one way or another, fallen into their hands. The amounts are staggering, ranging from \$18 million to as high as \$152 million (and that's in cold, hard U.S. dollars, mind you, not some tepid, squishy sub-Saharan currency).

Why have I, a humble journalist from a sleepy suburb of



Boston, been chosen by so many people to share in this most excellent windfall? I'm still not sure (although I do pride myself on being trustworthy, dependable and willing to give complete strangers personal financial info), but in one way or another they all obtained my e-mail address from a surprising variety of unexpected sources.

### Lucky Me

Agogo Mustapha, a senior accountant with the Office of the Honourable Governor, Central Bank of Nigeria, says he got my address "through a secret enquiry I made from your country's Chamber of Commerce down here."

A couple of Nigerian military officers, Gen. Benjamin Ojani (retired) and Brig. Gen. Bibiola Waritimi, both said they obtained my "contact" from the U.S. Embassy/High Commission in Abuja. (Despite my suspicious nature, I took both these

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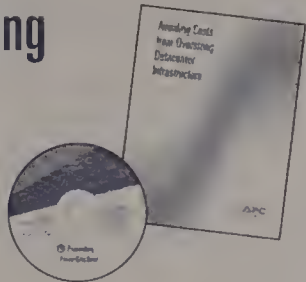
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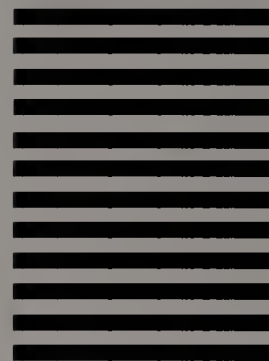
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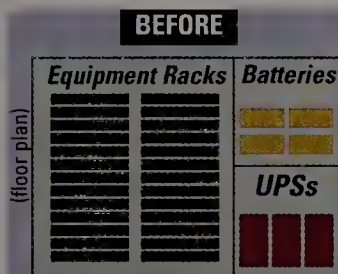
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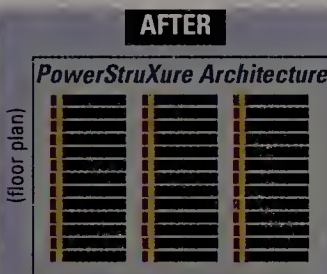
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missives seriously because they thoughtfully added THIS IS NOT A SPAM MAIL to the subject line.)

A Senegalese gentleman, Kalibu A. Omar, said he was “writhing following the impressive information about you through one of my friend who runs a consultancy firm in your country.” I have no idea what this consultant said about me, but it must have been hot stuff to make Mr. Omar writhe. Normally, I don’t have that effect on people.

I was a little less impressed by how Johndear Franka found me. He admitted that my e-mail was given to him by “the Girl who operates computer.” But he did add that I was the only person he was contacting. And here I thought I was just another random address.

**Mr. Dumbushe is so impressed by my business acumen that he wants to pay me \$2.68 million if I will only let him invest in my next venture, whatever it may be. In fact, he’s willing to send that money—sight unseen—to my bank if I simply send him my account number.**

What’s been even more delightful is that in the past year, I’ve started to receive these generous offers from VIPRFALs (very important people related to former African leaders). Manuel Savimbi, for example. He is the son of Jonas Savimbi, the former leader of UNITA, a rebel group that fought for years in Angola. (He died on the battlefield earlier this year.) Mariam Abacha, the wife of the former Nigerian head of state, the late Gen. Sani Abacha, dropped me a line, as did Mrs. Sese-seko, widow of the late Zairean president Mobutu Sese-seko. Mobutu’s son also sent me a nice note.

### Have We Got a Deal for You!

These are just a few of the people who have proposed business deals with me that dwarf anything former Enron CFO Andrew Fastow could have dreamed up—and he was a really inventive guy. The sources of these riches tend to fall into two categories. In the first, my proposed benefactor has discovered that the owners of certain large bank accounts have passed away and the banks, despite their best efforts, have failed to locate any next of kin. Seeking someone honest and upright to work with, they’ve fallen back on Plan B—me, a “foreign partner,” who will provide a bank account into which they can deposit their stash o’ cash.

In the second category, my benefactor is part of a deposed or deceased political or military leader’s family and wants to hold

on to the family fortune before the new, upstart government absconds with it. Naturally, he needs someone outside the country to help—me and my bank account.

For example, here’s how Mr. Omar came into the big bucks: “In my department (the telex and credit department of the Sengal-Dakar Agrobank) we discovered an abandoned sum of \$31 million, in account of our foreign customer who died along with his entire family in November 1999 in a plane crash.... We agree that 30% of the money will be for you as foreign partner...10% will be set aside for expenses...60% would be for ME and my colleagues, there after I and my colleagues will visit your country for disbursement.”

My take: a sweat-free \$9.3 million. And all I have to do is provide him with the number of one of my bank accounts (could this be easier?), a safe haven where the cash could sit until he could arrange for “disbursement.” That should be enough, with compounding, to cover my daughter’s first year at Barnard, or if my son continues to fake lightning-bolt-like periodontal pain when I ask him to brush his teeth, two years at the Actors Studio.

Brown Dumbushe was the chairman of a contract review panel in Zimbabwe

before being chased from the country because he was a member of the opposition party. He recovered \$26.8 million from overinflated contracts and has been able, somehow, to move those funds into a secure account in the Netherlands. Now, Mr. Dumbushe is so impressed by my business acumen that he wants to pay me \$2.68 million if I will only let him invest in my next venture, whatever it may be. In fact, he’s willing to send that money—sight unseen—to my bank if I simply send him my account number.

Hey, that could be seed money for the online pet store I’ve been thinking about launching. I think the domain name Pets.com might be available.

I feel particular sympathy for Kaba Jamila, whose father, a wealthy cocoa merchant in Abidjan, Côte d’Ivoire, was poisoned by his business associates. Mr. Jamila will give me as much as 20 percent of his \$16.5 million inheritance if I “SERVE AS THE GUARDIA OF THIS FUND SINCE I AM A BOY OF 26 YEARS.” Again, all I have to do is provide a bank account and serve as a guardia. Piece of cake.

I’m less inclined to help some of my correspondents, in spite of their pleadings. Take the Sese-Seko family. They may be honest, law-abiding citizens themselves, but their dad’s administration made Boss Tweed’s 19th-century political gang look like the cast from *Zoom*, not to mention the fact he wreaked three decades of havoc upon the Congolese people. From the





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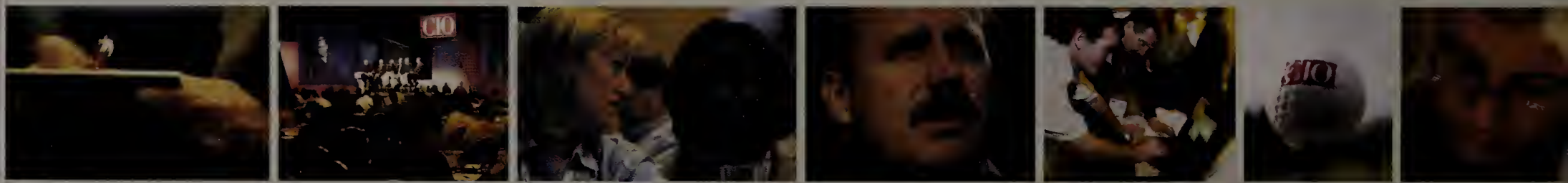
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hundreds of millions papa plundered from his countrymen and women, mom and son only have \$30 million squirreled away. And in keeping with Dad's greediness, neither of them offered me a cut up front, though they did say remuneration would be discussed. Mom just wants me to help her invest the funds so that she may "acquire real/landed properties and stock in multi-national companies."

I'll pass on this one. Even if I did want to help them, my investment track record the past two years should be enough to dissuade them.

Another e-mailer, Dr. Efe Osamende, coordinator of the federal government of Nigeria contract review panel of the Nigerian National Petroleum Corp. (NNPC), had the gall to think that I would consider accepting a large sum of money fraudulently. He said that the NNPC over-invoiced a contract with a conglomerate of foreign companies to the tune of \$24.5 million. And he expects me to help him get his hands on his ill-gotten gains? Try some other sucker, Dr. Efe. (I'll bet he isn't even a doctor.)

### Confidence Game

When I have the occasional twinge of doubt about these opportunities, wondering if they're really on the up-and-up, I just

reread the reassuring legalese that most of the e-mails provide. For example, Gen. Ojani assures me that "this transaction is NOT ILLEGAL and we will NOT ENTER INTO ILLEGALITIES AT ANY STAGE OF THE TRANSACTION TO TRANSFER THIS FORTUNE ABROAD; EVERYTHING WILL BE TRANSPARENT AND PROPER."

And this is the word of a military officer. A general, no less.

So with my golden years provided for and plentiful tuition funds for the young'uns, I sleep more easily these days. And because my family's needs shortly will be taken care of forever, I can now share my good fortune by forwarding to my friends all the e-mail offers that continue to flow into my inbox at an amazing rate. I still can't figure out why I have been so blessed, but it brings me great joy to know that I can share my bounty with others, peaceful in the knowledge that THESE ARE NOT SPAM MAILS. **CIO**

Just because Senior Editor Todd Datz will shortly become rich beyond his wildest dreams doesn't mean he's not still keeping his eyes open for a good thing. If something good comes your way, you can reach him at [tdatz@cio.com](mailto:tdatz@cio.com).



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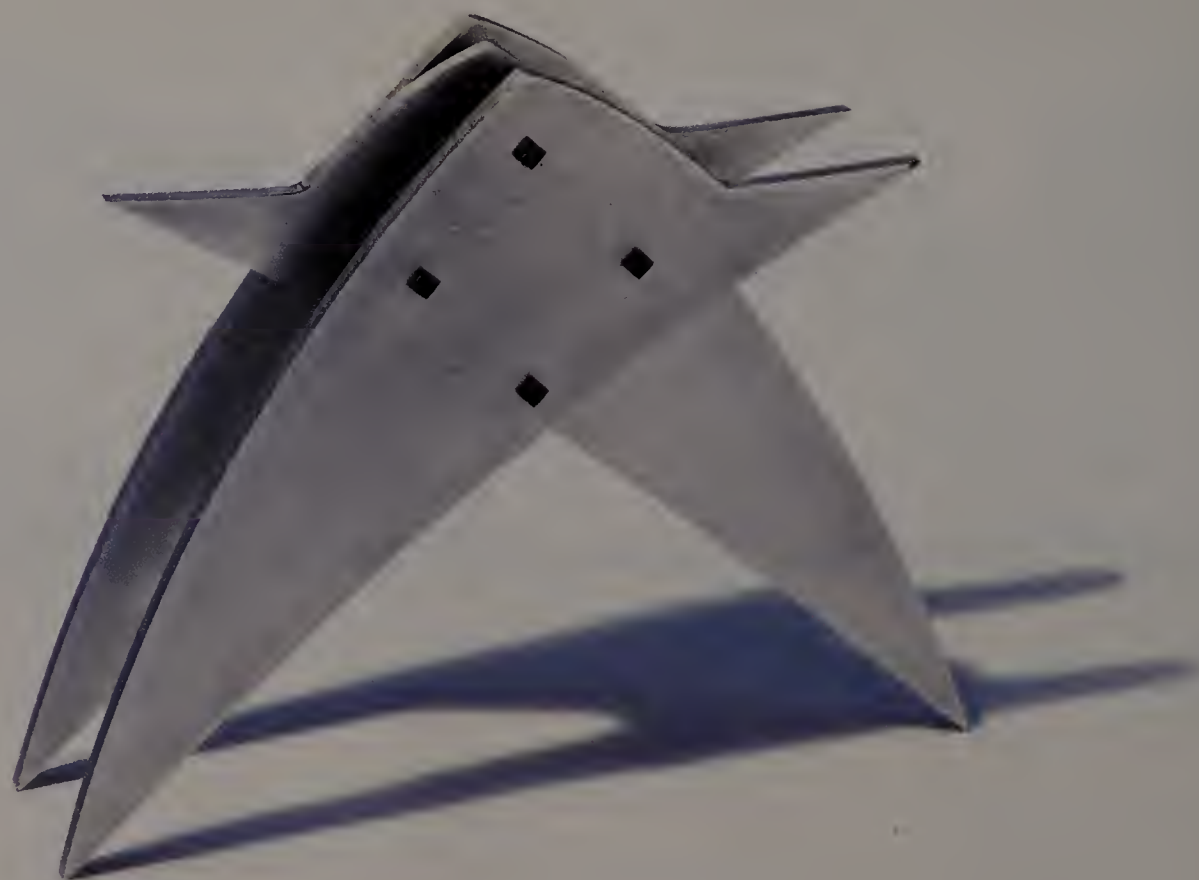
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for solid business cases when investing in technology

BY RICHARD PASTORE

# value

This is a good year for enterprise value. The protracted economic slump has placed a white-hot financial spotlight on IT investments. If 2002 was the year of IT budget and staff cuts, cost reduction and contract renegotiation, then 2003 is the year of value, ROI and bang for the buck. Investment decisions will be simple—no value, no funding.

While not every company will calculate the dollar payback of every IT investment,

## ENTERPRISE VALUE AWARD WINNERS

### University of Illinois Medical Center

#### OFF THE CHARTS



An electronic medical records system at the University of Illinois Medical Center did more than transform

communication, it converted the least likely users into technology believers. **PAGE 46**

### Wharton School of the University of Pennsylvania

#### BEST IN CLASS



By licensing its database research service to business schools worldwide, the Wharton School brand earns

high marks. **PAGE 52**

### Con-Way Transportation Services

#### CRUISE CONTROL



This freight delivery company's leaders took four years to get a new expert system right. Now they're

watching as the benefits roll in. **PAGE 60**

### Health Decisions

#### THE LITTLE COMPANY THAT COULD



Fed up with the manual process of running clinical trials, Health Decisions takes a chance on a new way of

doing its core business—and succeeds in an industry of large competitors unwilling to change. **PAGE 68**

### Securities and Exchange Commission

#### FULL DISCLOSURE



The electronic financial disclosure system known as Edgar streamlines regulatory compliance

for multiple constituencies while transforming the interface among the investor, the stock share issuer and the SEC. **PAGE 74**

### Awards Process

#### VALUE JUDGMENTS

Enterprise Value Award winners must run a review board gauntlet and pass muster with five picky CIOs before they can claim the enterprise value mantel.

**PAGE 80**





few will buy or build systems without knowing when, where and how they will pay off. CIOs, CFOs, line of business executives and IT vendors will team up to build value-based business cases grounded in reality rather than wishful thinking. We will not repeat the sins of the past, when an estimated \$62 billion was wasted on IT spending in 1999 and 2000 during what George Colony, CEO of Cambridge, Mass.-based Forrester Research, calls a frat party of naked technology—IT that was not clothed in enterprise value.

The five winners and two runners-up, singled out from the 80 companies that competed in CIO's 11th annual Enterprise Value Awards, set an example for this new value era. Though most of them made their investment decisions in the mid- to late 1990s (the award rules state that submitted systems must be operational for at least two years), they were not investing in naked technology but in systems that had sound business cases.

Their value took many forms—ranging from transformational to operational; though, interestingly, the majority of the honored systems facilitate and optimize data collection, analysis and retrieval. But what all the companies had in common was a crystal clear understanding of their core business value; the courage to reexamine what they do, how they do it and with whom they do it; and a commitment to careful change management.

### Eye on the Prize

"The difference between the winners of an Enterprise Value Award and those who come very close is the extent to which those winners understand the value proposition of their business, and the degree to which they orient their work to that business value," says Carolyn T. Purcell, CIO for the state of Texas and Enterprise Value Awards judge.

The value proposition was eminently clear to Enterprise Value Award winner Con-Way Transportation Services. Its core business model, which is fairly unique in Con-Way's overnight trucking niche, was the value engine, not any IT system. "That

model is the key to Con-Way's competitive edge," says Douglas W. Stotlar, executive vice president and COO of the Ann Arbor, Mich.-based freight shipper. Expert system technology was available from academic labs that could help Con-Way automate its nightly freight routing, but Con-Way would have had to adapt its business model to the technology. "There was no way we would ever touch our business model to accommodate an outside system," says Stotlar.



Instead, the company spent \$3 million and several years to internally develop what may be the first system of its kind in the industry (see "Cruise Control," Page 60).

### Digital Disrupters

While Con-Way sought to preserve and enhance its value engine, other award winners saw their business models, processes and norms as ripe for revolution, and they stepped forward to shake up the status quo. "They transformed the way they were looking at themselves within their market space and their competitive positioning," says Doug Barker, Enterprise Value Awards judge, former CIO of The Nature Conservancy and now CEO of Barker & Scott Consulting in Washington, D.C.

Health Decisions, in fact, has planted the seeds of disruption for its entire industry.

The small clinical research organization in Chapel Hill, N.C., built a clinical-trial data management process that remade the front and back ends of its drug development testing business, bringing multitasking and real-time response rates to an industry accustomed to waiting months to receive data analyses. Company founder and CEO Michael Rosenberg had a vision for how his company could deliver greater value measured in speed and cost savings. "I think

there are a lot of efficiencies that are waiting to be realized in this industry, and what we hope is that we will be the catalyst for these changes," he says (see "The Little Company That Could," Page 68).

Another award winner that remodeled core processes is the Securities and Exchange Commission in Washington, D.C. The SEC modernized its venerable electronic data gathering, analysis and retrieval (Edgar) system to take advantage of the Web's instant accessibility. Edgar now enhances the fairness and efficiency of capital markets by simultaneously making available to everyone, even individual investors, the timely corporate financial data necessary for making informed decisions.

Web-based Edgar is "literally redefining the interface among the investor, the actual stock share issuer and the SEC," says Gregor Bailar, Enterprise Value Awards judge and executive vice president and CIO of Capital One Financial in Falls Church, Va. (see "Full Disclosure," Page 74).

University of Pennsylvania's Wharton School bucked its own established norms when it made the controversial decision to offer an internal academic research database management and analysis toolset to the outside world—including its fiercest competitors. That move sounds illogical but "it was a smart maneuvering of internal assets," says John Glaser, vice president and CIO of Boston-based Partners HealthCare System and a veteran Enterprise Value Awards judge. By licensing the research engine to other B-schools and nonprofits, Philadelphia-



based Wharton not only fulfilled its mission to disseminate knowledge, it receives licensing revenue that funds system maintenance and enhancement. Adding a delicious irony to the arrangement is that rival schools are paying Wharton, in effect, to market its brand (see "Best in Class," Page 52).

In the same vein as Wharton, MasterCard International at first planned to create an online service tool for internal use only. But the MasterCard team saw greater value in extending online services to its member banks as well. The company held focus groups with financial institutions and heeded their recommendations for which services to include in what became Member Services Online (see "Online Services...Priceless," at [www.cio.com/printlinks](http://www.cio.com/printlinks)). The effort paid off in massive efficiencies for all parties and enhanced member relationships, earning MasterCard an honorable mention from the judges.

## Change Masters

Keeping an eye on the value prize and being open to challenging the status quo will pave the way for enterprise value, but only savvy change management will drive it all the way home. Perhaps the most impressive demonstration of this critical success factor comes from the University of Illinois Medical Center at Chicago, which needed to convince its doctors to use an electronic patient medical records system and reap the benefits of reduced errors, faster retrieval and enhanced communications (see "Off the Charts," Page 46). This powerful constituency initially resisted the system because it couldn't see past the extra time it took to create a medical record in the system. (If you don't know how tough doctors can be on IT, read "How to Win Friends and Influence Users," available at [www.cio.com/printlinks](http://www.cio.com/printlinks).) So Associate Vice Chancellor Joy Keeler enlisted another powerful group—nurses—to help convert the doctors. Illinois has accomplished what every hospital wants to but few have been able to do, says Glaser.

Another example of a company that has succeeded at change management is Conway, which knew its truck dispatchers might resent a proposed expert system that would automate much of their job and supposedly do it "smarter." So the company involved them in a multiyear system design and testing process. Sold on a vision of the technology taking the tedium out of their work, the dispatchers became so invested that they were more anxious than anyone to see

Keeping an eye on the **value prize** and challenging the status quo will pave the way for enterprise value, but only savvy **change management** will drive it all the way home.

the complex system finally up and running.

For the Enterprise Value Award winners, "Change management was a fundamental aspect of their overall implementation plan," says Rebecca Rhoads, vice president and CIO of Lexington, Mass.-based Raytheon and a returning Enterprise Value Awards judge. "There was an appreciation for the significance of the cultural changes. Many of the companies brought the [internal and external] customers into the solution and involved them in the problem."

Sometimes the right way to minimize user resistance and still achieve the value goal is to pick the most appropriate, user-friendly technology, which may not always be the newest and most glamorous IT on the block. Health Decisions chose fill-in-the-bubble paper forms and optical mark readers—rather than an Internet-based system—to collect testing

data from the doctors in the field. MasterCard built the services its members wanted most into its online offering. These companies "eschewed the opportunity or the temptation to build a technologically elegant solution," says Purcell. "Rather, they listened to their customers and committed to providing the service their customers needed."

Technology choices were also at the heart of Belo Interactive's goal to create an online content management system. The Internet subsidiary of Dallas-based media company Belo chose largely to leverage legacy systems, rather than investing in costly and unfamiliar new technology, to integrate content flow across Belo's stable of 24 websites, sister newspapers, TV stations and cable networks (see "All the News That Fits," at [www.cio.com/printlinks](http://www.cio.com/printlinks)). The judges were impressed enough with the effectiveness of this approach to award Belo Interactive with an honorable mention. "This is a smaller company pursuing reuse of what they already had to distribute content in a way that's cheap and integrated," says Bailar. "That's hard to do, and they did it with a small group."

If value is the name of the game for IT in 2003, then these organizations have shown that they know how to play to win. "Their applications were the products of teams at companies where dollars are very precious today," says Purcell. "These teams presented to their management a value proposition on which they were willing to stake their personal reputation. They took risks, but they had the confidence to bring these projects in on time and on budget, and to actually realize the benefit they projected." The systems, begun in better times and judged in the harsh light of this economic malaise, have withstood pressure from naysayers, penny-pinchers and vested interests to prove that IT can and must deliver unassailable enterprise value. **CIO**

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Richard Pastore is CIO's deputy editor. E-mail him at [pastore@cio.com](mailto:pastore@cio.com).



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# off the charts

## BREAKTHROUGH CUSTOMER CARE

An electronic medical records system at the University of Illinois Medical Center did more than transform communication, it converted the least likely users into technology believers

**By Christopher Koch**

**D**octors at the University of Illinois Medical Center in Chicago used to hide patients' medical charts under hospital beds. Better that than let a precious chart descend to the bureaucratic black hole known as the medical records storage department. Let the chart go and a doctor might never see it again. So the doctors would hide it until they were done with it. "We called it hoarding records," says Dr. Bill Galanter, who used to hide his patients' records in his office rather than under their beds for fear the mattresses would get changed.

Now those records are electronic and accessible from anywhere in the hospital or the Internet. Hard copies don't exist anymore. When the medical center built its new outpatient center in 1997, it did not include a records storage room. "We burned the bridge. No paper," says Joy Keeler, the IS leader of the medical records conversion, drawing out those last two words while boring a friendly hole in your forehead with her intense brown eyes.

Keeler is a born campaigner, a small, thin wisp who burns very brightly. For five years she has been pounding the halls of the motley scattering of old and new buildings that compose the medical center, trying to convince doctors to change the way they practice medicine. If that sounds like a grandiose goal, it's because she had no choice. She could not do her job without first changing how doctors did theirs. Change management is important to any system implementation, but it's everything in a hospital. There is no value to an

PHOTOGRAPHY BY JEFF SCIORTINO





**Associate Vice Chancellor Joy Keeler and Dr. Charles Rice, vice chancellor for health affairs, insisted that the University of Illinois Medical Center's electronic medical record system be a culture change—not just a technology project.**



electronic medical record if doctors don't use it. It is an all-or-nothing proposition.

The University of Illinois Medical Center won an Enterprise Value Award because of a brilliantly executed change management strategy, through which it managed to get the toughest users on the planet to lift their heads up long enough from the work of saving lives to change the way they deliver care to patients. Most believe they can do their work better and more cost-effectively than they did before the system. Computer system value doesn't get much better than that.

### A Big-Bang Implementation

Change is hard. Despite their complaints about paper medical records, doctors really don't want to give them up. Only 4 percent to 15 percent of hospitals nationwide have electronic medical records today, according to various industry estimates. It's still faster

## Award-Winning Value

**GEMINI** has improved patient care by centralizing record-keeping and transforming how doctors and nurses document patient care and communicate with one another. The system makes patient data available anywhere, anytime.

to scribble a note than it is to sit at a computer and enter data.

Speed is an obsession with doctors because they see between 16 and 30 patients a day. "I have a maximum of 20 minutes to do everything when I see a patient," says Dr. Patrick Tranmer, head of the Department of Family Medicine at the medical center. "I have to find out what's wrong, get their history, do a physical exam, make a phone call, write a prescription, instruct the patient, make a follow-up appointment and then educate a student doctor about what I've just done."

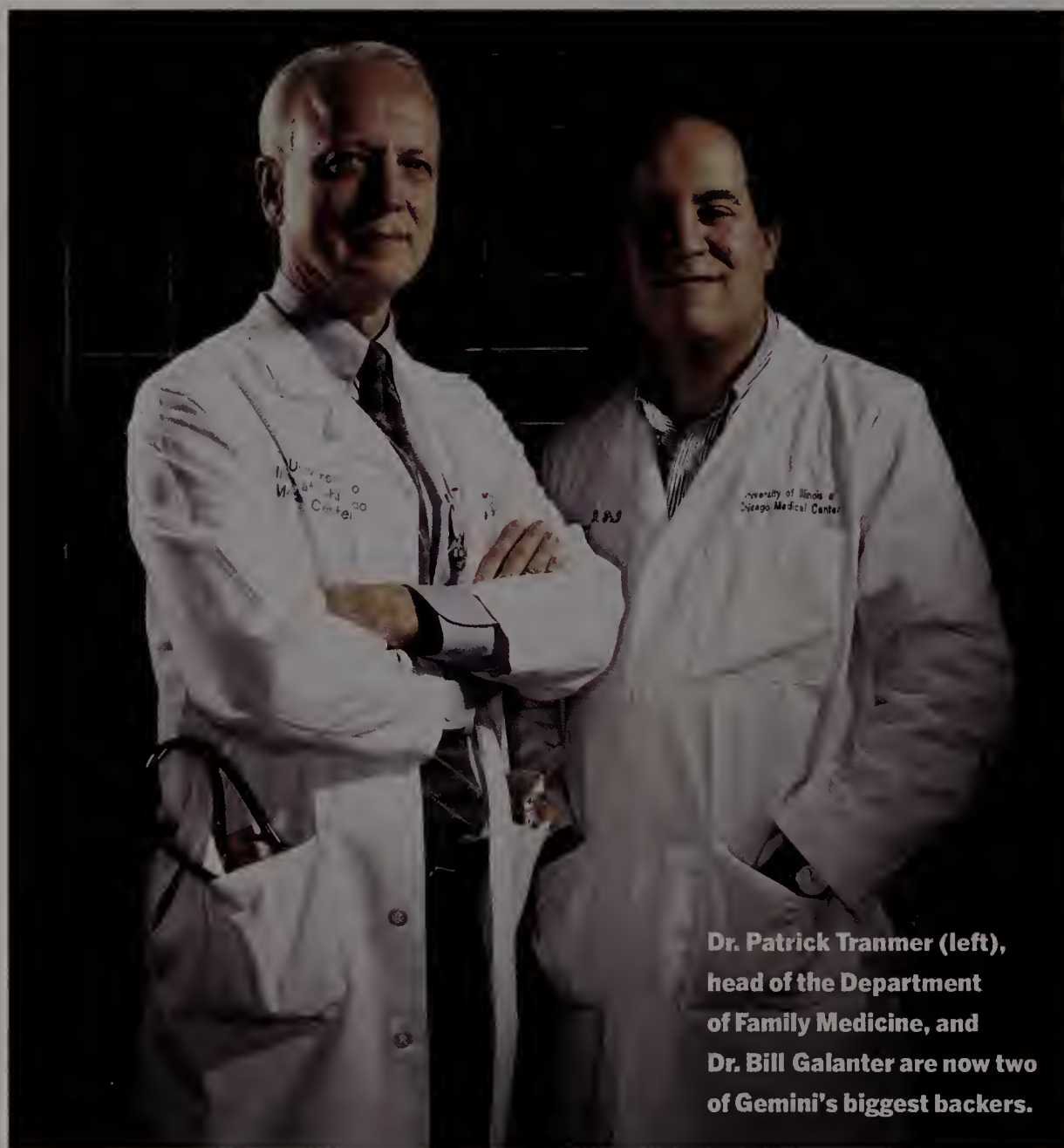
Seconds matter when you're in that 20-

minute zone, says Tranmer, who stares impatiently at his notebook computer while waiting for Gemini, as the medical center's assemblage of applications is known, to come up on his screen. Ten seconds pass. He pushes the computer away. "It's slow today," he says.

Gemini was balky because a chip inside one of the Compaq Alpha computers that runs the system burned up the day before, bringing down the entire system. Ironically, it had been so long since the last outage that the doctors forgot how to access the read-only backup database that Keeler had built for such emergencies. Angry calls streamed into IS. One doctor demanded, "Do you want me to waste time asking my patients about their medical histories?" That's how valuable the electronic records have become to the doctors—many think they can't do their job adequately without them.

The doctors' characteristic impatience explains why Keeler chose a big-bang implementation—the riskiest possible strategy. There would be no pilots. The system went online in two big gulps: the outpatient clinics in early 1999 and the inpatient hospital later that year. Rollouts to selected groups would have collapsed at the intersection of the paper and electronic records, says Tranmer. "Doctors would have said, Now this is twice as hard. Forget it." Worse, he says, they would have rejected the electronic system because the old way was more familiar.

Getting those impatient people to accept a new system required extraordinary patience at the highest administrative levels. When a financial crisis hit the hospital in 1998, outside consultants recommended outsourcing IT and with it the Gemini project, which had begun in 1996. But in 1999, Dr. Charles Rice arrived. Rice, the vice chancellor for health affairs, moved Keeler's IT



**Dr. Patrick Tranmer (left), head of the Department of Family Medicine, and Dr. Bill Galanter are now two of Gemini's biggest backers.**



group from operations into his administrative department to subsume the IT budget and take outsourcing off the table.

"This is an educational institution," says Rice. "Part of our job is to educate the next generation of medical workers. I don't know how you do that with an [outsourcer]." During those difficult days, Rice insists that the board never questioned the investment in the electronic medical record project—which is now at \$11.2 million and counting, with a \$1 million annual maintenance budget.

Keeler is certain the project would have

and said, I need a desktop. I need an inbox."

Today, the system mimics the look and functionality of an e-mail inbox, except that it is more powerful, combining messaging capabilities with workflow from the different applications hidden under its skin. For example, when a doctor logs on, she'll immediately see her phone messages, reports needing her signature and alerts from other doctors who need her help. Keeler knew the powerful inbox metaphor would be an excellent way to draw reluctant doctors into the guts of the application—the medical record.

## How Gemini Works

**THE GEMINI** applications run on "clustered" (combined) Compaq GS160 and GS60E Alpha machines utilizing VMS version 7.2-1h1, UCX (TCP/IP) version 5.0-A, and Oracle 7.3.3.6 as the database. The Alphas' disks use a combination of RAID-1 and RAID-5 modes with complete drive shadowing, maximizing system availability, and complete system redundancy. ADSM is used for backups, performed nightly as online backups of the 500GB database. The network supports 3,000 dedicated PCs and more than 4,500 clients, and includes 185 intel servers.

founded without such support. "First and foremost this has to be the strategy of the organization," she says. "This isn't a project; this is a culture change. Transformation has to be the goal of the organization—not just of the chief medical officer or the CIO."

### Finding a Better Way to Doctor

This emphasis on transformation—not implementation—drove Keeler's dealings with the project's startup software vendor, Kansas City, Mo.-based Cerner. As she pushed for applications to be built, Cerner built them: separate, discrete applications for all the tasks that doctors and nurses perform when they interact with a medical record. As Keeler watched the icons multiply across her system test screen like popcorn, she sent Cerner back to the drawing board. "We're not implementing applications; we're trying to transform the process," says Keeler determinedly. "Cerner didn't understand that. What they gave me in 1996 was a bunch of applications. That's why I went back to them

The screen immediately shows Keeler's primary intent with the system: improved communication. Doctors used to play phone tag for days to coordinate referrals and conferences. With Gemini, they can trade messages that have the specific content attached to them for action. Nurses used to pointlessly page doctors because they couldn't read their handwriting or because they were bouncing messages between doctors, patients and pharmacies. Now they can leave a message for the doctor in the system, and the doctor can automatically chart the prescription and send it to the pharmacy. Nurses tell Keeler that automating the prescription process saves them an hour each shift, or about \$1.2 million annually.

Accessing information is the other process that has been transformed. Chasing down X-rays and lab reports devoured doctors' days. Doctors, nurses and patients endured "nonvisits," where doctors sent patients home because they didn't have the information to treat them or had to order duplicate

tests because they couldn't find the original results. Now the labs simply access patient records through Gemini and attach their reports when they are ready. Although not all tests or reports are yet electronic, the stack of paper associated with one patient at the hospital has decreased from about 300 pages to about 75, says Keeler, and it continues to drop each year.

Today, the benefits of the electronic record are inarguable. Nearly 90 percent of doctors at the center believe communication and accessibility have improved since the paper days, according to surveys performed by the project steering committee. Though he has no hard numbers to prove it, John DeNardo, the medical center's executive director, insists that the system has made his business more efficient, allowing doctors to see more patients per day and reducing the average length of stay in the hospital. But when Keeler first rolled out the system, those benefits weren't immediately apparent. Initially, doctors resisted because they couldn't or wouldn't see past the extra time it took to create a medical record electronically.

This is why Keeler enlisted a powerful constituency—nurses—to help convert the doctors. Part of the reason doctors could put up with the inefficiencies of the paper medical record is that they passed much of the labor off to the nurses. Can't find an X-ray? Send a nurse after it. Can't locate a doctor? Ask a nurse to find him.

### The Revolt of the Nurses

Revolutions start when the downtrodden see a way out of their predicament, so Keeler focused on the nurses. She hand-picked those who were viewed as leaders by their peers. Then she trained them as power users. They came to know so much about the system that they didn't just train other nurses, they influenced the doctors' acceptance of the system.

Doctors were too busy to listen—at first. "I said the same thing to the nurses after the system was installed that I did before it went in," recalls Tranmer: "'Get me the X-ray.' Except I noticed that instead of 10 minutes it





took the nurse one minute to get it. After that happened again and again, I finally said, 'How did you do that?'" Eventually Tranmer learned how to do it himself and became one of the biggest backers of Gemini.

Roseanne McBride manages the nurses in the "stepdown" clinic, a 27-bed unit that monitors patients who are coming out of intensive care until they can be transferred to regular rooms in the hospital. She has been around the medical center long enough—15 years—to identify the primary difference between the old paper-based system and Gemini: doctor compliance. "This was our opportunity to say to the doctors, 'We're not doing your documentation for you anymore; you do it,'" she says. "It put ownership of the information back where it belonged."

## Selling the Doctors

To get doctors to use the system, Keeler had to make one major concession: allow them to enter their clinical notes and observations any way they wanted. They can type free-form or dictate data into the record and aren't constrained by specific computer-generated forms. Galanter, who is leading the next phase of the project of adding KM capabilities, lives with the effects of that concession. "We made a conscious decision at the beginning that we would not force people to use the system in a way that would make decision support easier down the road," he says. "If we had forced them to enter information in such a way that it would generate more discrete data, we would never have gotten everyone to use the system."

Until document management systems can make sense of the free-form data that doctors enter, Galanter is focusing on keeping doctors and nurses from making mistakes

with medications by programming alerts into the system that warn a doctor when a medication conflicts with another that the patient is already taking, for example. According to David Bates, M.D., chief of general medicine at Harvard's Brigham & Women's Hospital in Boston, computerized medication order-entry systems can reduce medication errors by 55 percent. Though

The biggest value the system provides is its ability to deliver all the data about a patient to any doctor, anywhere, anytime.

medication errors don't always harm a patient, when they do the costs are high. In a study, Bates found that two out of every 100 hospital patients suffer an adverse drug reaction—at an average cost to the hospital of \$5,857 each—that is preventable through better medication management.

Yet the biggest value the system provides is simply its ability to deliver all the data that exists about a patient to any doctor, anywhere, anytime, so that the doctor can apply his own knowledge management to the data in the system. When Galanter was on call recently, another doctor's patient called him saying she had lost her medications and couldn't remember anything about them except their color. "I was able to get on the Internet, get into her record, see who the doctor was, see what he had prescribed and call in the order to her pharmacy," he says.

It's a story he repeats in his practice every day. "I know that I am providing infinitely better care every day because I have all the information in front of me," says Galanter. "I make fewer mistakes in care because I know so much more than I used to."

## The Battle not Won

Despite the value Gemini has demonstrably delivered, a minority of doctors in the hospital still refuse to have anything to do with it. Two departments, ophthalmology and otolaryngology, have never used the system for various reasons, says Tranmer, and

among the individual resisters (about 20 out of 250 doctors who see patients at the hospital), the majority are surgeons. Acknowledging the opposition, Dr. Larry Ross, head of the department of urology and a practicing surgeon, says, "Surgeons tend to be very results-oriented and want to get in and out as quickly as possible, as opposed to the more introspective specialties like internal

medicine." In his department, he sees older surgeons and those who dislike using computers as the biggest resisters. But Ross is a backer of the new system and says all new resident surgeons are being trained to use it.

Overall, 20 percent of doctors described themselves as "reluctant users" of the system in a survey in 2000. Though Keeler has not surveyed the doctors again, she is certain that number has decreased now that the system speed has been goosed up and more computer terminals have been added.

Keeler, who became associate vice chancellor in 2002 to focus on the development of strategic initiatives for the next phase of Gemini, has brought the hospital a long way. "We're about 20 percent done," adds Rice. The other 80 percent will come through a gradual introduction of more discipline in the order-entry methods, a tighter link between the medical record and the billing system, and making records available to patients over the Internet.

"Getting everybody electronic is the Holy Grail," says Enterprise Value Awards judge John Glaser, vice president and CIO of Partners HealthCare System in Boston. "[Illinois Medical has] laid the foundation, but they can't stop there and say they've transformed patient care. This system puts them in the position to begin that transformation." **CIO**

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### CIO.COM JOY KEELER, the

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## COMPETITIVE BRANDING

By licensing its database research service to business schools worldwide, the Wharton School brand earns high marks

**By Elana Varon**

A waist-to-ceiling whiteboard dominates Wharton School Associate Dean and CIO Gerry McCartney's tiny basement office below Locust Walk, the broad, leafy footpath through the heart of the University of Pennsylvania's main campus in Philadelphia. In the middle of the board, McCartney has scrawled a "hit list" of new financial market data he plans to acquire for Wharton Research Data Services (WRDS), the school's Web-based collection of 100 finance and accounting databases and statistical analysis tools. At thousands of dollars a pop, buying and maintaining that many databases (not to mention the terabytes of storage to support them) would break the IT budget of most business schools. But not at Wharton. McCartney can afford them because he isn't buying for his school alone. More than six dozen business schools around the world, including Wharton's top competitors, buy access to WRDS (pronounced "words") for \$30,000 a year. As long as the system covers its costs, McCartney can provide what he likes to call "a data supermarket."

The reason schools such as Harvard, Stanford and Northwestern's Kellogg School of Management are willing to purchase a tool emblazoned with a competitor's logo is that WRDS makes research easier. Those 100 data sets come in many different formats; Wharton delivers them in a standard format that makes it easy for researchers to merge data from different sources and use it with popular analytic software. As a result, finance and accounting professors—who

PHOTOGRAPHY BY JIM GRAHAM





**While Wharton CIO  
Gerry McCartney avoids  
the entrepreneur  
label, he was quick to  
recognize the market  
potential of the school's  
collection of databases.**



advance their career by uncovering new insights into corporate performance and the workings of financial markets—can publish papers in almost half the time and consider questions that would have been too difficult to address without easy-to-use data. Meanwhile, Wharton—already known for its expertise in finance—has made a name for itself as a premier provider of academic computing services, applying the WRDS model to the development of teaching and information dissemination tools.

Wharton is honored this year with an Enterprise Value Award because it has used WRDS to extend the value of its brand by turning its competitors into customers and making business school faculty around the world more productive. “The value they’re providing is not just to Wharton but to research in [other] universities,” says Doug Barker, CEO with Barker & Scott Consulting in Washington, D.C., and one of this year’s Enterprise Value Awards judges. “[WRDS] is realizing the promise of a networked world.” Says Patrick Harker, Wharton’s dean: “We know we’ve crossed this magical line when junior faculty at other institutions are saying that a condition for them taking their jobs is having access to WRDS.”

But the potential of WRDS might have gone unrealized were it not for the willingness of key decision-makers—not just at Wharton but throughout the business research community—to reexamine their value proposition. “Quite frankly, it didn’t seem like a blockbuster application at first glance,” says Thomas Gerrity, the Joseph J. Aresty professor of management at Wharton, who was the dean when WRDS was deployed in 1994. “It’s kind of a pretty good idea. It might be helpful to some people,”



**A former IT director at Wharton, Paul Ratnaraj first saw the need to build a labor-saving system, and later realized he had delivered something other business schools would value.**

Gerrity recalls thinking. “But the lights didn’t go on; trumpets didn’t blow.”

### Filling an Unknown Need

No one asked for WRDS. Paul Ratnaraj, then the director of core systems, data services and operations with Wharton Computing and Information Technology (WCIT), pitched the application as a labor-saver after observing that faculty and doctoral students spent 40 percent of their time programming—writing database queries and reformatting data so that they could use it for

analysis, and asking Wharton’s in-house database experts for help. Academic financial research relies on statistics. Researchers look, for example, for relationships between market valuations and corporate earnings to reach conclusions about how well traditional measures of corporate performance explain the stock prices of the late ’90s—crunching data about thousands of companies in the process. Ratnaraj, now CIO with The Pew Charitable Trusts in Philadelphia, figured that if he converted a couple of popular Fortran-based databases into an easier-to-use format and wrote a few screens for building queries, professors and their students wouldn’t have to be power users—or need as much help from his staff—to extract the information they needed. “[Users] just wanted the data as soon as possible,” he recalls. “They did not need to write the code to manipulate it.”

After McCartney was hired as CIO in

## Award-Winning Value

**WHARTON** provides its online collection of finance and accounting databases and statistical analysis tools, Wharton Research Data Services (WRDS), to competing business schools on a subscription basis, extending the value of its brand and making business faculty around the world more productive.



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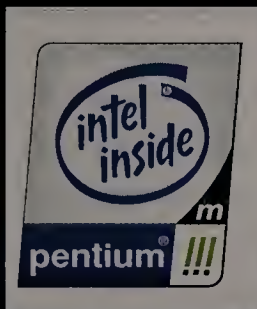
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1993, Ratnaraj assessed the costs and benefits of WRDS and collected endorsements from his tech support staff. McCartney gave him \$20,000 to cover the cost of storing the reformatted data. Ratnaraj wrote the original version of WRDS in SAS—the statistical software most faculty use to analyze their data—and programmers Steve Crispi and Son To then used the prototype to build the program. Later, Crispi produced a Web version.

Wharton's faculty was pleased, and the story of WRDS could have ended there. In the ongoing battle with other top-tier schools to attract star researchers, Gerrity, an expert in the strategic use of IT and founder and former CEO of the Index Group, knew technology was a big selling point. Gerrity charged McCartney with building a state-of-the-art IT infrastructure to brand Wharton as a computing powerhouse. WRDS was a brick on the path to IT excellence.

## Defining a New Market

While the internal value of WRDS was readily apparent to Wharton's leaders, the decision to sell it to other business schools happened practically by accident. After deploying the system, Ratnaraj wrote a paper about it that he presented at an SAS user conference, then "showed it off" at a meeting of Business Computing Directions, a professional association for business school IT managers. It was then that Ratnaraj realized Wharton was onto something big. "Immediately a lot of other schools seemed very interested in the concept," he says. "And the first question was, Can you give it to me?" In academia, sharing tools among colleagues is the norm.

Despite the giveaway tradition, both Ratnaraj and McCartney thought other business schools should pay for WRDS. "There were real costs here," McCartney recounts. "This wasn't a couple of student programmers bringing something out in an afternoon."

Besides, McCartney figured, the real benefit of WRDS wasn't the code for reformatting the Fortran data or the pre-scripted queries, but the ongoing technical support that Wharton—acting as an application serv-

**CIO.COM** **GERRY MCCARTNEY**, CIO of the Wharton School of the University of Pennsylvania, will be available to answer your questions online through Feb. 14. To post questions and read responses, go to **ASK THE SOURCE** at [www2.cio.com/ask/source](http://www2.cio.com/ask/source).

ice provider—would provide. Research universities use many of the same databases and hire experts to mount the tapes, maintain them, help faculty run queries and troubleshoot. As McCartney saw it, there was no value to having these same tasks reproduced at every school, and Wharton would benefit by its association as a data services provider. By creating a dedicated staff to support WRDS, Wharton would reinforce its reputation for cutting-edge finance research.

But first McCartney had to convince the Wharton faculty and administration to accept this vision. "Big institutions have very high moments of inertia," McCartney observes. "They're hugely indifferent about many, many things."

## Making the Sale

McCartney gives the impression that he is not indifferent to much, and that he has no qualms about going out on a limb. He greets visitors on a midsummer afternoon wearing a black and red Hawaiian shirt and khaki

linen pants. He spikes his conversation with hyperbole (the process that graduate students go through learning to read Fortran data is like "eating a Vaseline sandwich") and occasionally lets slip, in his Liverpool accent, a slightly off-color word. Although he eschews the entrepreneur label, he prefers work that is radical to the routine. To a large extent, Wharton extracted the full, groundbreaking value of WRDS because McCartney and Ratnaraj wouldn't stop talking about it.

By the mid-'90s, corporate CIOs had shed their reluctance to outsource some IS functions, but universities, competitive in everything, still guarded their computing infrastructure. Ratnaraj says he sensed IS departments were resisting because they were worried about their own prestige. "They were looking at their own self-interest, rather than the user self-interest," he says. At the same time, it was clear that anyone who saw the WRDS demo understood its value. "You saw in their faces that they liked it," Ratnaraj recalls.

As the buzz about WRDS grew, Wharton, faculty and administrators worried that if they sold WRDS they would be giving away their deliberately crafted competitive advantage. Some faculty members also voiced fears that if McCartney and his team were providing service to paying customers, Wharton's own needs would be neglected. The school lawyers questioned whether

## How WRDS Works

**SUBSCRIBERS ACCESS WRDS** (Wharton Research Data Services) on the Web or through a telnet connection. Software developed in-house based on C, Perl and SAS, for which Wharton owns a patent, is used to authenticate users and manage their access to more than 100 databases (subscribing schools must purchase licenses to use databases hosted by WRDS from the respective data vendors). The servers are networked to approximately 2 terabytes of fibre channel disk array storage.

Users can import data from these databases into a variety of statistical analysis software, including SAS, Matlab and Microsoft Excel, either by building queries on the Web or writing their own programs using SAS, C, Fortran or other languages. Data can be downloaded in standard formats, enabling researchers to easily combine information from different data sets. The system provides users access to SAS software for doing data analysis on the WRDS system if they choose.



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Wharton, as a nonprofit educational institution, could charge money for anything that wasn't directly related to its teaching.

"I don't want to imply that people were against it like they're against nuclear devices," says McCartney. "They thought, [WRDS is] fine, why mess around with it?" Professor Michael Gibbons, chairman of Wharton's acclaimed finance department and now one of WRDS's biggest supporters, recalls making a less charitable assessment of McCartney's subscription scheme. "I thought it was going to be a loser," he says.

The in-house debate was moot until 1997, when the administrative dean with the Stanford Graduate School of Business called McCartney to sign up. McCartney had given then Wharton Dean Gerrity a business plan, describing the equipment and staff he would need, and the number of customers and amount of revenue he expected. Now Gerrity gave McCartney the green light. "Our mission is the advancement and dissemination of knowledge," Gerrity recalls concluding, and selling access to WRDS would fulfill that mission. "People also concluded over time that if this actually began to work, we could build a more capable [IS] resource, and that is what has pretty much materialized." Nevertheless, Gerrity extracted a promise from McCartney that service levels for Wharton faculty wouldn't suffer.

## Customers and Value

Having Stanford as its first customer gave WRDS credibility. "When Stanford stepped up, there were three or four [other] people who said, We want to sign up too," says McCartney. Meanwhile, potential WRDS competitors such as the University of Chicago's Center for Research on Securities Prices (CRSP), which produces the most popular data sets used by academic finance researchers, passed on the opportunity to offer its own version of the service. "By allowing Wharton to host our data, I was making our data more convenient to access," says David Barclay, CRSP's COO. "Being an application service provider is not something I consider to be one of our core competencies."

Ravi Pillai, Stanford Business School's research computing manager, says the decision to subscribe to WRDS was mainly financial. The faculty didn't care where they got the data from, only that they had access to it. Stanford administrators decided subscribing to WRDS would be a good way to reduce the cost of a planned system upgrade by offloading data storage to Wharton. It also took pressure off Pillai to acquire enough staff to maintain all the data—another selling point for the Silicon Valley university during the tech boom.

As other schools joined Stanford, it became clear to Wharton faculty and administrators that their brand was gaining prestige. Ratnaraj describes a sales call he made to Harvard Business School, during which he was asked whether Harvard could pay Wharton extra and not have to display the WRDS logo. He countered that he'd give WRDS away for free but the logo had to stay. As Ratnaraj relates it, the request was a throwaway, but the incident illustrates how well competitors understand what Wharton gets from the deal. "Wharton was never in it for the money," says Ratnaraj. About \$5 million of the revenue the school has collected from WRDS since 1997 has been reinvested in the system, which costs about \$1.8 million a year to run. While Wharton Dean Harker says faculty members don't come to Wharton only because of WRDS, it's a potent recruiting tool nevertheless because it signals to potential faculty "the creativity of our computing group" and Wharton's commitment to supporting research.

## More Enterprise Benefits

Wharton has achieved far more value from WRDS than recognition for its computing prowess. For one thing, WRDS has become a more powerful tool—and has a higher

level of support—than it ever would have if Wharton had kept the service to itself. A dedicated staff of 11, which includes not only technical personnel but also academic researchers who are expert users of WRDS databases, keep the system running and provide customer support. Michael Boldin, an economist who is WRDS's research and support services director, says he and his staff can sometimes do a better job helping faculty than the data providers can because "we understand better the kind of work a person is doing."

With a wider user base, it's easier to justify investment in new databases too. "There may be a great database that two of us would really like to use here," says Gibbons, the finance department chairman. "Now the calculation is that if there are two here, there are probably two at many of the other clients."

WRDS has also raised the performance bar for Wharton's computing group. "It's made us look at opportunities more vigorously," says McCartney. The experience with WRDS led McCartney to launch two other externally facing initiatives: Knowledge@Wharton, a free webzine and online library for business research; and the Alfred West Jr. Learning Lab, an online resource for teaching tools, including a trading and investment simulator and a competitive bidding game. Knowledge@Wharton has more than 200,000 subscribers worldwide. The Learning Lab is currently used only within Wharton, but the school plans to market it to other educational institutions. WCIT also designed new, wired podiums for the lecture halls in Wharton's new campus building—Jon M. Huntsman Hall, which opened last October. "We want Harvard to go buy a Wharton Lectern," McCartney says.

If it were up to him, McCartney would spend more time on strategic initiatives such as WRDS. "I have to run my own e-mail systems," he says. "But if I could spend 100 percent of my budget on research and education, I would." **CIO**

**CIO.COM** Read **TAKING THE TEDIUM OUT OF RESEARCH** to learn how the Wharton Research Data Services system makes research easier for one Wharton professor at [www.cio.com/printlinks](http://www.cio.com/printlinks).

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## CON-WAY TRANSPORTATION SERVICES INC.

HEADQUARTERS Ann Arbor, Mich.

CORE BUSINESS Freight delivery

REVENUE \$2 billion

EMPLOYEES 17,000

URL [www.con-way.com](http://www.con-way.com)

### KEYS TO SUCCESS

- Invested users in development process to ensure buy-in
- Chose largest, most complex business unit for testing and initial rollout
- Used slow, methodical deployment to guarantee system quality
- Designed system to complement business model, rather than adapting model to a system

# cruise control

## MAXIMUM WORKFLOW EFFICIENCY

This freight delivery company's leaders took four years to get a new expert system right. Now they're watching as the benefits roll in.

**By Richard Pastore**

**A**nn Arbor, Mich., 5:09 p.m., a typical Tuesday afternoon in late 1996.

Marty Robinson has been scrambling since his shift started 99 minutes ago. As Con-Way Central Express's line-haul dispatcher, Robinson has to gather and sort through a foot-and-a-half stack of mainframe printouts showing what freight needs to move between 200 locations across 25 states and Canada during the next 12 hours. Robinson reviews tonnage, available drivers and trucks, and trailer capacity at each of the 40 locations assigned to him. Like the other seven dispatchers sitting in a brightly lit tray of cubicles, he must plot the nightly routes that will transport 50,000 shipments of heavy freight on 2,100 trucks from their origin points to midway freight-assembly centers. (A midnight shift will route the freight from the assembly centers to its final destination.)

Con-Way's model for line-haul—the movement of freight over long distances from service center to service center for redistribution—forces Robinson into a perpetual tug-of-war between the promise of on-time overnight delivery (a nonnegotiable customer expectation) and efficiency. For efficiency's sake, he must build routes with the fewest miles, maximize trailer loads and make sure drivers, who are nonunion, can get home when their daily shift ends. The clock ticks insistently on the whitewashed wall that's covered by maps of the Midwest. Robinson has 51 minutes left to finish the route plan and start typing his instructions to individual freight

PHOTO BY BEN COLMAN



**Champions of Con-Way Transportation's homegrown expert system (from left): Director of Decision Technology YaFeng Du, COO Douglas Stotlar, and Michael Kucinski, director of line-haul and freight flow at Con-Way Central Express.**





depots and their waiting drivers. But there's a snag. He's got two more freight units to ship from Indianapolis to Louisville, Ky., and he's out of trailer space.

Robinson can reroute a truck from Terre Haute, Ind., to Indianapolis to grab the two units, but the truck would have to return empty to Terre Haute to meet its incoming load. That's 130 nonrevenue miles.

He shouts to his neighbor John, visible over the low cubicle wall. "Have you got

Canada Express, decided back in 1996 that it needed to automate Robinson's job. The result of this decision, coming after two years of painful development and another two years of deliberately slow deployment, is the line-haul automation system. Each afternoon, this expert system dutifully digests on average 80,000 customer pickup orders and change requests. Its optimization model plots delivery across all the service centers and determines which shipments

cutoff time for overnight shipment requests, letting customers submit orders, when necessary, right up until the end of the business day—a competitive advantage, since businesses would rather not have to arrange their activities around shippers' schedules.

### Adapting a System, Not a Business Model

In 1996, Con-Way Central's then Line-haul Director John Labrie contacted a University of Michigan academic consulting group to explore the possibilities of an expert system. While FedEx and other companies have had route optimization models for overnight flights, the kind of technology that applied to less-than-full-truckload line-haul was still largely the stuff of university labs. Con-Way quickly discovered that the university group and other outside developers would require the company to modify its fairly unusual business model to suit the system. Con-Way plans all delivery routes from the origin site of the shipment, rather than using a hub-and-spoke model, and all its drivers go home at the end of their daily shift. "The alternatives all required us to change, and we knew our model worked very well and was critical to our competitiveness," says Douglas W. Stotlar, Con-Way Transportation's executive vice president and COO.

The practices have helped make Con-Way the perennial earnings leader in its niche of less-than-full-truckload, time- and day-definite freight delivery. So the company made the risky decision to dedicate on-staff industrial engineer (and former Chinese Army rocket scientist) YaFeng Du to develop Con-Way's own expert system, starting with its biggest and most complex group, Central Express.

"I figured it would take me six months, but I told them it would be a year in order to make more room," Du says with a sly grin. It ultimately took five years and \$3 million to develop, test and deploy at Con-Way Central in late 2000. The delay came from the excruciating challenge of extracting the business rules and logic from the minds of

Con-Way discovered that outside developers would require the company to **modify its business model** to suit the system.

anyone in your area who can divert to Indianapolis for two units?"

No, John's already short of drivers for Cincinnati. Robinson could keep checking, but he can't afford the time. He eats the empty miles and shifts his attention North, to Chicago.

Actually, Con-Way's line-haul dispatch job is even more complicated than the image drawn so far. For example, Robinson's working with only 85 percent of the day's freight orders. The rest come seeping in while he's wrangling his route plan. And an ice storm he hasn't yet heard about may shut down one of his cities, throwing another monkey wrench into his plans.

This complexity is the primary reason Enterprise Value Award winner Con-Way Transportation Services, which operates Con-Way Central, Western, Southern and

should be loaded on which truck—all this in seven minutes flat. The incremental efficiencies generated have repaid the \$3 million investment within the first two years.

Even without that kind of hard-dollar return, Con-Way would have funded the project simply because it could not sustain the status quo. The stressful dispatch position was difficult to fill and had a learning curve as long as 18 months. The procedures and business rules the dispatchers followed were undocumented, making the company uncomfortably dependent on the knowledge in the dispatchers' heads. A line-haul automation system with an optimization model at its heart would get the job done faster and more consistently, letting dispatchers use their time to troubleshoot problems that could jeopardize on-time delivery. And Con-Way would be able to extend its

## Award-Winning Value

**CON-WAY TRANSPORTATION** maximized the efficiency of its overnight freight trucking business by developing an expert system to automate and optimize planning of overnight shipment routes. The system relieves dispatchers of much of their arduous nightly tasks, and consistently routes freight using fewer trucks traveling fewer miles and carrying greater loads per trailer than manual route planning.





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the dispatchers, coding them into the expert system, and getting it to work. Tests produced routes that were far from optimized—a truck would be sent out of its way, or a driver would be stranded too far from home to get back during his shift. The interrelationships of all the variables were so complex that a fix to one flaw would cause two new problems. Because faulty system output would often take as long as a month to surface during testing, each change necessitated a stressful, fingers-crossed waiting period.

### User Struggles

It's been two years since Con-Way deployed its system at Central Express. But Du, a fidgety man with a ready smile, still seems anxious to get back to his computer to work on changes for further implementations. Du says his biggest development mistake was that after talking to just one dispatcher, he rushed a rudimentary system into place after three months as a proof of concept. "I should have spent more time with the dispatchers and

should have done some dispatching myself," says Du, now director of decision technology. After the letdown of the demo, Du struggled to accommodate the various styles and problem-solving preferences of all the dispatchers. They peppered him to add so many rules that the system and its developer

**Con-Way's line-haul system** gives the trucking company an edge: Customers can now place orders later in the day.

were overwhelmed. "We had thousands of rules after a while," says Du. "It was very frustrating, and I came close to giving up, thinking we'd never get it to work." Lines of C++ code mushroomed to 250,000 (100,000 lines are now active). In the end, Du's boss, Stotlar, who looks too young at 41 to be COO of a \$2 billion company, told the dispatchers enough is enough. "I had to lean on them a bit; they were throwing everything in but the kitchen sink," Stotlar recalls.

But Du's time spent with the dispatchers was not wasted. This group could easily have felt threatened by the project and sabotaged it. Instead, their sweat spent to help build the new system bought equity in it. "This had to be acceptable to the guys here. All you'll get is alienation if you stuff something down someone's throat," says Michael Kucinski, who took over as director of line-haul and freight flow at Con-Way Central when Labrie

was promoted to run Con-Way Western. Kucinski acted as a rudder "to keep attitudes straight" and remind his dispatchers that "there was a light at the end of the tunnel." And with time, Kucinski says, they really learned how much they appreciated line-haul automation after computer crashes

forced them to go back to manual routing on three occasions.

"It saves us a lot of time each night, which we use to make sure we've got accurate order information, look into problems and handle changes," says Robinson, who helped test the system and is now line-haul supervisor at Con-Way Central. The system captures customers' shipment pickup requests throughout the day, including orders coming as late as 5:15 p.m. It flags suspect data for the dispatchers to verify or correct, such as freight dimensions and weight specs that don't seem to correlate. It then works its optimization magic, taking just seven minutes to generate a routing plan for 95 percent of the day's overnight shipments. Dispatchers, now trained as analysts on a managerial track, massage the plan via a Web interface, solving any remaining driver shortages and tweaking routes for exceptional circumstances.

### The Payoff

The line-haul automation system routinely manages to extract efficiency improvements of 1 percent to 3 percent over results achieved with manual route planning. For example, comparing two single nights moving similar tonnage, Con-Way Central used 111 fewer trucks and 68 fewer drivers, drove 26,530 fewer miles, and boosted the average truck's load by 370 pounds. Stotlar says he initially guessed the differential would have been higher, but Kucinski and



**VP of Information Services  
Jacquelyn Barretta is  
making sure the new  
expert system meets  
Con-Way's IT standards.**



Robinson, not surprisingly, expected only this modest improvement. But all would agree, given Con-Way's volumes, that the incremental gains would tip any weigh station scale. They add up to between \$4 million and \$5 million in savings annually from paying fewer drivers, moving trucks fewer miles, packing more freight per trailer and reducing damage from rehandling freight. Con-Way Central has been able to reduce its dispatch personnel by three people (through attrition) and can keep the group small as it adds business.

Customers, in the meantime, benefit in a couple of discreet ways. One is improvement in on-time delivery. While Con-Way is reluctant to attribute its 99 percent on-time performance directly to the line-haul automation system, there's no doubt freeing dispatchers from the tedium of routing has given them more time to prevent delays.

Another customer benefit is the later cut-off time for submitting orders. "It's a huge advantage over the competition, and it's also a great psychological advantage because it's the end of the business day," says Kathleen F. Curley, research professor in Information Systems at Boston University's School of Management and a member of the Enterprise Value Awards application review board. Con-Way doesn't market the extended time to its customers; it wants to avoid being overwhelmed by last minute calls. But when an urgent situation comes up for a customer, "you have until the end of the day to call Con-Way and say, I really need this shipment to be picked up," Curley says.

According to Enterprise Value Awards judge John Glaser, in businesses like Con-Way's, there are only a small number of variables to maximize for strategic value. "Truckload fill rate is the name of the game

## How Line-haul Works

**CUSTOMER SHIPMENT PICKUP REQUESTS** from various channels are routed via IBM MQSeries messaging to an IBM mainframe. MQ Messaging loads the data into a line-haul application, developed in Java and running on a Windows 2000 platform. This application allows line-haul dispatchers to review and adjust the data. Available drivers, trucks, trailer space and weight data are stored in an Oracle database. This application then feeds the data to the optimization expert system, running on a Sun platform. The optimization model uses 100,000 lines of C++ code to crunch the numbers and create optimum routing for 95 percent of the day's freight shipments.

for them, and they improved it," says Glaser, vice president and CIO of Partners Health-Care System in Boston.

When it came to bringing the new line-haul system to other regional operating groups, Con-Way also took its time. The system, undergoing constant tweaks and upgrades, ran in parallel to the manual way of doing things for a year at Con-Way Central. Then for more than a year, the live system was monitored to see how consistently it handled Central's workload. The deliberate pace and choice to implement first at Con-Way's biggest operation bulletproofed and validated the system. "Nothing is more critical to this company than line-haul; no system failure could bring us to our knees more quickly than line-haul," Stotlar says.

Even perception of failure was a threat to the field staff's fragile faith in the project. "We'd laid the groundwork here and in the field that this was the wave of the future," Kucinski says. "If the system experienced any prolonged failure at any point, that would have been shot. The perception would have been that we just can't automate this."

### Mending an IT Disconnect

Despite the cautious pace and sagacious involvement of the users, Con-Way Transportation committed a classic business-IT alignment faux pas. Du did the technical design and coding of the optimization model on his own, then, in his words, "I gave it to the IT department and said, 'This is it. You have to figure out everything else.'"

"Everything else" meant integrating Du's

optimization model with the rest of the line-haul automation components, including an existing load-plan application and Oracle database, plus developing new interfaces, providing maintenance and leading subsequent rollouts. The handoff to the 150-person, Portland, Ore.-based IT group was far from the ideal for Jacquelyn Barretta, Con-Way Transportation's vice president of information services. "We had a lot of concern around that. YaFeng is very talented, and not many people have the same abilities he does. So we would have preferred to start working on this earlier to make sure we understood the model," Barretta says. She notes that there's still a lack of documentation, and the model didn't adhere to IT's coding standards, making it tougher to support. There's also the risk that a change to the applications that capture and transmit shipment orders, among others, could have an unanticipated impact on Du's model. All the more reason to gain a full understanding of its nature and code.

Toward this end, Barretta recently dedicated a staff member to become an expert in the optimization model, and sent the person to classes to gain a better understanding of the disciplines behind it and what makes it tick. In the meantime, IT staffers still see the optimization model as a hands-off "black box" and call on Du to diagnose and fix problems via remote access to their servers.

In spite of those concerns, the four IT staff members dedicated to deploying and maintaining the line-haul automation sys-

**CIO.COM** Con-Way Transportation Services VP of IS **JACQUELYN BARRETTA** will be available to answer your questions online through Feb. 14. To post questions and read responses, go to **ASK THE SOURCE** at [www2.cio.com/ask/source](http://www2.cio.com/ask/source).





tem have forged ahead. In March 2002, Line-haul Automation Project Coordinator Scott Van Winkle's team deployed a Web interface that for the first time lets dispatchers view the line-haul plan onscreen rather than in stacks of printouts. And they've been spearheading the line-haul automation's rollout in Con-Way Western Express, due for completion in December 2002, using a dispatcher from Central as an ambassador to smooth user acceptance. And this time there is no grueling extraction of business rules. The Western dispatchers were given parameters and a business logic table, and they were told to fill in the blanks.

Still, because the Western region's destinations are more spread out than Central's, the program needed some tweaks. Again, there was pressure from dispatchers to make changes to suit their individual preferences. Even Central was still trying to slip in more modifications. Barretta quickly learned to subject change requests to careful, structured review, requiring documentation of the request and review, and prioritization of the proposed change by line-haul managers in all three regions. Overall, ongoing maintenance on the system should average \$100,000 per year.

Another IT responsibility is making sure the mission-critical application never fails. MQSeries performance monitors scan for

**Con-Way Transportation dispatchers review the day's freight shipment orders and tweak the optimal routing plan provided by the line-haul automation expert system. They relay routing specifications to field personnel at the company's freight depots, who pack the trailers for their nighttime runs. The goals are maximum trailer capacity, minimum truck miles and assured overnight delivery.**

certain threshold numbers that could indicate trouble in the order pipeline. When a threshold is reached, IT staff pagers start clamoring. A crash in the IBM WebSphere server that powers the system will cause an automatic failover to the server used for development. About 105,000 shipment orders move through the system each day, with a spike in the late afternoon. The architecture, based on J2EE, is built to accommodate volume spikes and overall business growth.

Plans call for building optimization bridges across the company. Once line-haul automation is running in all four Con-Way operating regions, each will have visibility into the others, making it possible to, say, take an available truck and driver from Southern and press them into service for Central. The coding is already complete for this capability and other enhancements, such as adding weather conditions into the routing plan, and simulating what happens if Con-Way adds new terminals, for example.

### Faith in Long-Term Strategy

Looking back over seven years to the inception of the line-haul project, Du sees the

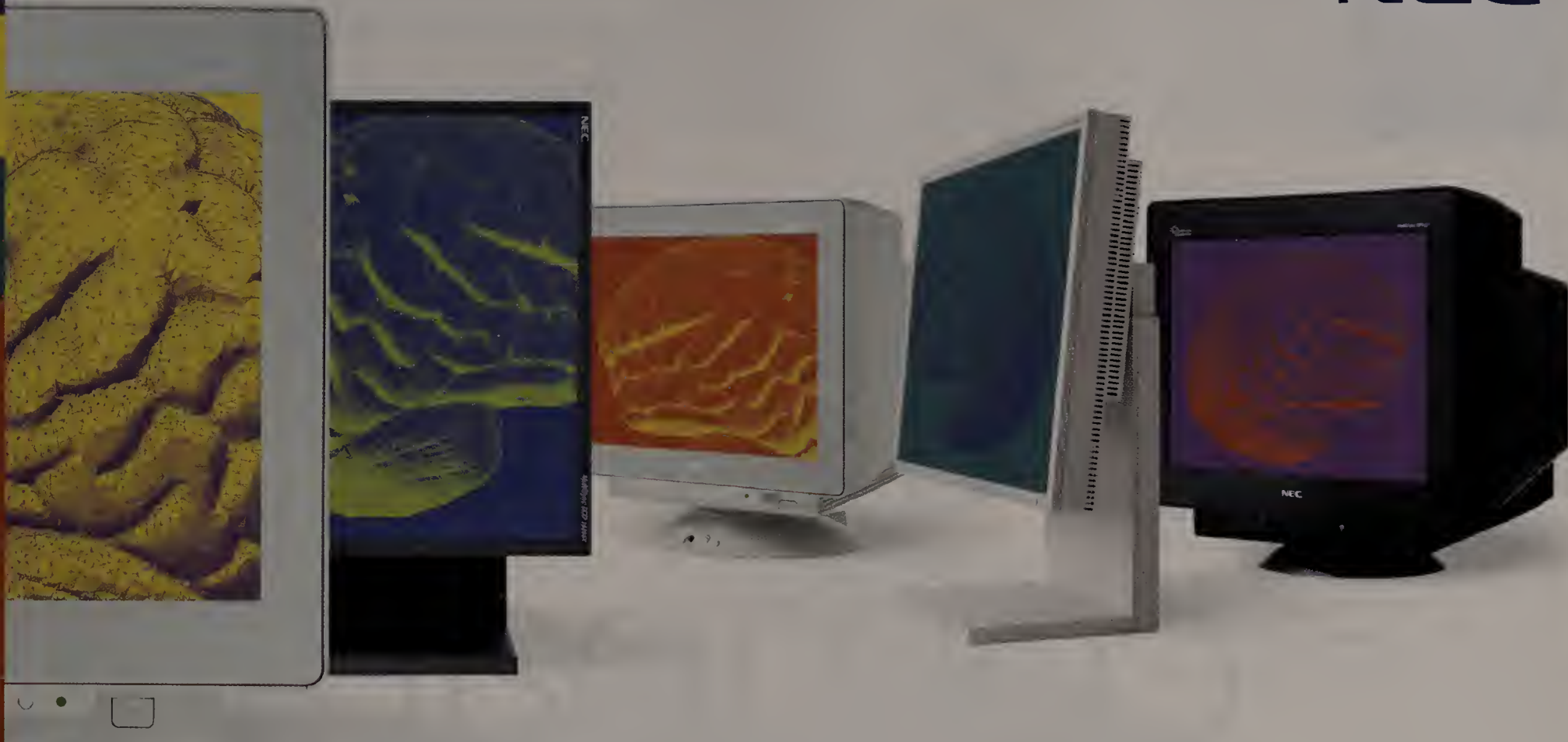
trust that Stotlar and Con-Way CEO Gerald Detter had in the project as its most critical success factor. "At certain times, things didn't look that rosy, but they never lost confidence," Du says. "They told me it didn't matter how slow it was, just keep working on it. So many people put their trust in me; that was my motive not to fail."

It helped that enough incremental progress was being made to indicate a probability of success, adds Stotlar. But another reason for Con-Way's faith was that it wasn't letting short-term ROI rule the day. In fact, Stotlar doesn't hesitate to answer "absolutely" when asked if Con-Way would green-light such a protracted initiative in today's lean times, when many companies won't invest in anything that doesn't promise a six-month payoff. "We understood the strategic value of this, we were comfortable with that, and we didn't get blinded by ROI," he says. "If you manage purely from an ROI perspective, you might have given up on this one early on. And that would have been a mistake." **CIO**

Richard Pastore is CIO's deputy editor and can be reached at [pastore@cio.com](mailto:pastore@cio.com).



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## HEALTH DECISIONS INC.

**HEADQUARTERS** Chapel Hill, N.C.

**CORE BUSINESS** Running clinical drug trials

**REVENUE** \$12 million

**EMPLOYEES** 65

**URL** [www.healthdec.com](http://www.healthdec.com)

## KEYS TO SUCCESS

- Reworked an entire process rather than just one piece to ensure speedy data analysis
- Chose a technology that didn't change its clients' habits in order to reduce clinician resistance
- Brought real-time data management to an industry that is used to waiting months for data

# the little company that could

## FASTEST TIME TO MARKET

Fed up with the manual process of running clinical trials, Health Decisions takes a chance on a new way of doing business—and succeeds in an industry of large competitors unwilling to change

**By Ben Worthen**

**E**verything about Health Decisions screams small company with big plans. Fancy new office-park headquarters fit the company like hand-me-downs on a kid brother. A half sheet of paper next to the glass front door lists every employee's name and extension, and people wander by would-be conference rooms in shorts or blue jeans. There's even a six-passenger corporate plane.

Yet there is something unmistakably special going on at the Chapel Hill, N.C.-based clinical research organization (CRO), which designs and runs clinical trials for pharmaceutical companies and government groups like the National Institutes of Health. Health Decisions, whose \$12 million annual revenue makes it the smallest Enterprise Value Award winner ever, is challenging a conservative industry's accepted drug trial process with the resolve of the Little Engine That Could, an appropriate comparison given founder and CEO Michael Rosenberg's favorite metaphor for his company.

"When James Watt invented the steam engine, people said, This is great because we don't have to use water wheels anymore," Rosenberg says. "But for a long time people took steam engines and put them by the river." They didn't realize they could save themselves the river trip by putting the engine where they worked—using the new technology to improve the process.

Health Decisions won an Enterprise Value Award this year

PHOTOGRAPHY BY PAUL DAGYS





**Health Decisions CTO  
Rick Farris (left) and founder  
and CEO Michael Rosenberg  
view their Enterprise Value  
Award-winning system as  
a disruptive technology.**



because it is using technology to change the way pharmaceutical testing is done, not just retrofitting an old process with new parts. Health Decisions' clinical management system can shave years off the drug development cycle and save sponsors millions of dollars. "It is an order-of-magnitude gain," says Partners HealthCare System Vice President and CIO John Glaser, a judge for this year's awards. "This is beyond remarkable."

Pharmaceutical companies spend an average of \$802 million and 10 to 15 years of research and testing to bring a new drug to market, according to the Tufts University Center for the Study of Drug Development. During that time, they are developing promising compounds, experimenting on

something that is essentially a [manual] process," says Rosenberg. "They can get the data into the system faster, but they haven't figured out how to use it faster."

Rosenberg started Health Decisions on the principle that technology could change the process of data collection and analysis. Traditionally, research coordinators at the clinics send the paper forms to the CRO, where data-entry clerks enter the information into a computer and check for mistakes and discrepancies, called queries, which in turn are sent back to the clinics for resolution. Each process is a discrete step that must take place before the next one begins. Rooms filled to the ceiling with unprocessed forms are common, and sometimes it takes

Mark Reader (OMR). It's not cutting-edge technology, but it reduces the staff needed to input data. Once the information has been scanned into the clinical management system, it goes through validation, query generation and resolution modules. When taken as a whole, a seven-year study can be completed in four, says Rosenberg. (Because no two studies are alike—each varies in terms of numbers of patients, types and amount of data collected, and number of locations involved—comparing one study to another is an apple-to-oranges comparison.)

Its results have gotten the company noticed. "From the beginning, [Health Decisions] has been able to incorporate technology in a way that has made it more efficient from a time and cost perspective than some other [CROs] that have been around longer," says David Windley, an analyst and senior vice president for Jefferies & Co. in Nashville, Tenn., who covers the CRO market. (Windley owns stock in Health Decisions competitor PPDI.) "It is the way it ought to be done in my mind," he says.

With a medical degree and a master's in public health, Rosenberg's résumé reads like a who's who of nonprofit medical research; he's served on advisory boards for the NIH and worked for the Centers for Disease Control and several smaller organizations. During that time, he became increasingly frustrated by the clinical testing process. So in 1989 he started Health Decisions in his basement and soon got a chance to prove himself. At that time, San Rafael, Calif.-based Oclassen Pharmaceuticals was preparing a trial on a genital wart medication, and it needed results within several days. When the CRO that Oclassen hired realized it couldn't process the data fast enough, Rosenberg convinced Oclassen that rather than change the study, he could run it—in the time allotted—using an OMR machine he had recently purchased for \$3,000.

The process he went through then was more manual than it is today. "We sent the information to the patients

## If Health Decisions can cut the cost of developing a drug in half, then smaller markets become economically viable.

animals, and testing on humans to find any adverse effects, determine dosage and ultimately see whether a drug does what it is intended to do. Most drugs don't; only five out of every 5,000 compounds are ever tested on humans, and only 20 percent of drugs that make it that far are ever approved by the Food and Drug Administration. In short, it is a long and expensive process that often fails.

CROs handle the human testing, or clinical phase of the process. They collect results from the doctors' offices that see the test subjects, check for mistakes and inconsistencies, and perform the statistical analysis. Currently, the vast majority of them do it all on paper, recording by hand the information they collect from patients—everything from date of birth to pain levels. Because so much time and money is at stake with a new drug, most pharmaceutical companies aren't willing to experiment with other processes. Those CROs that do electronic data capture (EDC) through the Internet claim to be innovative, but all they're doing "is substituting technology for

six months from the time a form is submitted to the time a query is answered.

### I Think I Can, I Think I Can

Health Decisions, on the other hand, realized that if it could connect previously disjointed steps by sharing data it wouldn't have to be a slave to the old process. "They started to connect these things in their heads and then built the systems that made it possible," says Bob Reck, a member of the review board for this year's awards, who spent more than 20 years as a pharmaceutical industry consultant. In a Health Decisions study, clinicians record patient data on bubble forms, similar to those used for academic testing. They then send the completed forms to Health Decisions, which scans the information into its system using an Optical

## Award-Winning Value

**HEALTH DECISIONS'** clinical management system is a disruptive technology that saves clinical trial clients significant costs and reduces time to market.





**CTO Rick Farris (left) and CEO Michael Rosenberg hope Health Decisions will be a catalyst for efficiency changes in the pharmaceutical industry.**

who were using the drug, and if we didn't get a response, we called them on the phone," says Rosenberg, who is part Godfather, part man-Friday, simultaneously overseeing his company and, at least to some degree, doing everything himself—including setting policies, running studies and even flying the plane. But the process bookends were the same: OMR forms to collect the data and an SAS system for data handling and statistical analysis. Health Decisions' first study was an overwhelming success and led directly to Health Decisions' second and third customers.

### **A Day at Health Decisions**

At 10 a.m. on a typical day at Health Decisions' headquarters, the FedEx man knocks on the wooden door and hands over an armful of 8-1/2-by-11-inch packages containing filled-in bubble forms. Minutes later the whirl of the OMR is audible in an oth-

erwise quiet office. The forms slip through the reader at a startling rate, less than a second per page. Health Decisions' data-entry module (which, like all of the company's systems, is homegrown) imports the OMR data and performs the initial validation. The system is capable of scanning at least 8,000 pages in a single day.

Once the data is scanned, the quality-assurance team runs the validation and query management (VQM) module. Like the data-entry module, it was conceived in 1989 and first modernized in 1993. The current version, built in 1999, accesses an Oracle database. It is a client/server application, which could in the long run impede its ability to scale, but CTO Rick Farris, a dotcom refugee who joined Health Decisions in 2001, is designing a Web-based version.

The VQM checks for missing fields, logic errors and answers that violate the study's protocol. It then generates queries and sends

them via e-mail to the submitting clinic. For example, in a contraceptive study, the system would generate a query if the age field says a subject is 13 years old and another field says she is taking birth control pills. The clinic would have to confirm that this is really the case or make a change if someone filled in the wrong bubble.

Queries are the bane of pharmaceutical research and a financial burden: Industry estimates are that each query adds up to \$200 to a study's cost. However, Health Decisions' OMR technology reduces errors at the origin point and when data is transferred to the data-entry system. Rosenberg estimates the industry average query rate to be one query per page. His company's rate is one-twentieth of that. The query rate is so small that Data Manager Jim Box jokes that he can tell when a clinic hires a new researcher because the query rate shoots up.

But it is Health Decisions' ability to turn



queries around within a day of receiving a form that leads to the real benefits. Since the clinicians filling out the forms receive queries while patient visits are fresh in their minds, they can provide answers easily and learn from their mistakes.

The queries go out as e-mails containing a link to an extranet where clinicians can enter corrected data directly into Health Decisions' Web data query module. The newest module in Health Decisions' system, a Web-based master subject log, tells the company the total number of patients the clinics have seen and exactly what data has

"The most important difference [in Health Decisions' process] is the time from the last patient seen to the closing of the database," says Herman Ellman, senior vice president of clinical development at Rockaway, N.J.-based pharmaceutical company Warner Chilcott. Since Health Decisions takes less time to clean its data before analysis begins—four days versus the industry average of 122 days, according to Rosenberg—drug companies can interpret results sooner. As was the case with the Alzheimer's drug, pharmaceutical companies can kill an ineffective drug right away. When a drug is successful, they can spend

them millions, but they are afraid because we don't require [as much staff]."

Rosenberg is philosophical. "This is a very conservative industry, and they don't want to see something that is very different," he says. "Something that is a little different they are willing to take a chance on, but to walk in the door and see something very new, most people's reaction is, Gee, I don't know about this stuff."

That's a typical reaction to a disruptive technology, which is exactly what Rosenberg thinks Health Decisions has. And with such technologies, profound implications are associated with them. Using the information faster not only saves time and money, it saves enough so that new markets may become viable. Today, big pharmaceutical companies won't even bother researching medicines to treat diseases with less than a billion-dollar-a-year market.

If Health Decisions, or any other CRO that emulates its methods, can cut the cost of developing a drug in half, then smaller markets become economically viable. Pharmaceutical companies would have more incentive to develop so-called orphan drugs, which treat relatively rare disorders like sickle-cell anemia that affect less than 200,000 people in the United States. It would be a change long awaited by many and the culmination of Rosenberg's public health career.

In the meantime, Health Decisions will continue trying to shake up the pharmaceutical industry. "If you look at the automotive industry, [American companies] were really complacent until the Japanese came and put a lot of pressure on them," says Rosenberg. "And the Americans had to learn how to do things better. I think the pharmaceutical industry is in its complacent stage, and I think it is going to start to get pressure to change. I think there are a lot of efficiencies that are waiting to be realized in this industry, and what we hope is that we will be the catalyst for these changes." **CIO**

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## How Clinical Management Works

**OPTICAL MARK READERS** scan the hard-copy forms collected from clinical sites.

Internal systems are written in Visual Basic and Java, while study sites and pharmaceutical companies access Java-based extranets to answer queries. Microsoft IIS and JBoss Web servers both run Windows 2000. The database server is a Windows 2000 system running Oracle.

yet to be submitted. Once all the data is collected, analysis begins, using an updated version of the SAS system Rosenberg first purchased in 1989.

### The Company's Big Break

Health Decisions' break came in 1996, when Protodigm, a wholly owned subsidiary of Roche, a \$15 billion pharmaceutical giant in Basel, Switzerland, hired the then seven-employee CRO (it quickly grew to 50 to accommodate Protodigm's needs) to test an experimental Alzheimer's drug. The trial contained more than 450,000 pages of data and tested 1,500 patients from 100-plus locations—making the number of patients about double that of the largest study the company had ever handled.

While the drug was ultimately a failure—it didn't clear the FDA's bar for relevant cognitive-skills improvement—the study was an astounding success for Health Decisions. The study took three and a half years from the time it started to the time the drug was killed. Roche estimates that killing the drug early saved the company \$32 million.

more time on data assessment while still submitting a new drug application to the FDA in a reasonable amount of time, says Cap Gemini Ernst & Young consultant Gary Green, a 25-year veteran of the FDA.

Yet, amazingly, Health Decisions' success has been an obstacle to its growth. "One problem we have is that our largest competitor [Quintiles, a \$1.6 billion CRO in Durham, N.C., a 10-minute drive from Health Decisions] will [tell its sponsors it has] 10 people in data management just for your project," says CTO Farris. "We say we have three or four data-management people in the company, and one will handle all your needs. In some proposals, [our competitors] have a pricing structure based on the number of queries. We specifically say we will reduce your queries. We are going to save

**CIO.COM** Health Decisions CTO **RICK FARRIS** will be available to answer your questions online through Feb. 14. To post questions and read responses, go to **ASK THE SOURCE** at [www2.cio.com/ask/source](http://www2.cio.com/ask/source).





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### KEYS TO SUCCESS

- Used past federal system modernization mistakes as a guide for what not to do
- Found ways to compromise and balance the needs of multiple constituencies
- Effectively used project management skills to ensure that the system came in on time, on budget and met its goals

# full disclosure

## UNIVERSAL INFORMATION ACCESS

The electronic financial disclosure system known as Edgar streamlines regulatory compliance and information access for multiple constituencies. It transforms the interface among the investor, stock share issuer and the SEC.

**By Megan Santosus**

**T**he federal government is littered with IT modernization projects that cost too much, took too long and delivered too little. When Richard Heroux joined the Securities and Exchange Commission to head up modernizing its electronic disclosure system known as Edgar, he was determined to learn from that legacy of failure. Armed with a master's degree thesis that plumbs the depths of federal modernization mistakes, Heroux applied his research to the SEC's three-year, \$22.5 million project.

Heroux's academic work paid off. The revamped Edgar system was successfully deployed on time, on budget and met its stated goals. In use since 2001, the modernized Edgar (short for electronic data gathering, analysis and retrieval) is a Web-based system that increases efficiency, streamlines bureaucracy and reduces the burdens of regulatory compliance. It has improved the financial disclosure filings system for a varied and sundry group of constituents both inside and outside the SEC, and is now the recipient of an Enterprise Value Award. Gregor Bailar, executive vice president and CIO of Capital One in Falls Church, Va., and an Enterprise Value Awards judge, cites Edgar for "literally redefining the interface among the investor, the actual stock share issuer and the SEC."

## Broad Mission

As the regulatory agency that oversees capital markets in the United States, the SEC's main mission is to protect investors by ensuring

PHOTOGRAPHY BY WALTER CALAHAN





**The SEC's Ken Fogash, acting director of IT (left), and Richard Heroux, Edgar program manager, say that Edgar has streamlined the bureaucracy and increased the efficiency of financial disclosure filings.**



the integrity of the securities industry. With Edgar, the SEC is now better equipped to carry out that mission. Edgar automates both the collection and dissemination of the financial data that public companies and their affiliated executives and officers are required to file with the SEC. By making that data available to investors via the Internet within 78 seconds of receipt, Edgar gives investors a foundation for making more

new Edgar to speed their reviews, better track their assignments and generally reduce their administrative tasks. And the SEC's filing community—composed of companies, their executives and officers, financial printers, filing agents, lawyers and accountants—relies on Edgar to take the sting out of submitting compliance forms such as 10-Ks, 10-Qs and S-1s. Edgar's easy-to-use electronic submission templates allow filers to

data—annual subscription costs have plummeted from \$278,000 to \$44,000 due to lower maintenance costs and cheaper, more powerful hardware. The lower costs have expanded the number of subscribers that analyze and resell Edgar data from eight in 1997 to more than two dozen today. Edgar has also enabled a whole new industry of third-party disseminators to spring up.

Edgar first started as a pilot project in 1984. The paper-based process the SEC relied on for years to collect the legally required regulatory data didn't lend itself to easy distribution, storage or access. In 1992, the SEC launched the first electronic version of Edgar, a client/server-based system filers used voluntarily. By 1995, filers had the option of sending documents to the SEC via dial-up, magnetic tape or diskette. Although those were improvements, Edgar had its limitations. SEC forms were available electronically, but Edgar was a limited, character-based system that did not allow such useful things as footnotes or reader-friendly graphics; forms filed electronically—without bullet points or boldface—had all the elegance of a DOS program. Nearly half of the filers hired financial printing companies to electronically submit documents to the SEC and then reformat the data to produce more reader-friendly versions. Operationally, Edgar was generally reliable, yet the centralized nature of the system spelled trouble for uptime.

In 1996, a few factors converged that made modernizing Edgar a top priority of then SEC Chairman Arthur Levitt. By then, filing electronically was mandatory, client/server technology was showing its age, and the Internet was picking up steam. The SEC

## For the SEC, the modernized Edgar has **trimmed operational costs** by \$150,000 per month.

informed decisions. William G. Heninger, an assistant professor of information systems in the School of Accountancy and Information Systems at Brigham Young University in Provo, Utah, has studied Edgar's effect on the market. "When the filings hit [electronically], there was a significant change in stock prices," says Heninger, something that didn't happen with the SEC's previous paper-based disclosure system. He says that Edgar has also created a level of fairness that was not available before: "Edgar put detailed information out into the hands of the average everyday investor." Previously, such information was the exclusive domain of investment companies, pension fund managers and other investment professionals. In short, Edgar—by furnishing investors with timely and actionable financial information online—enables the SEC to increase both the fairness and efficiency of capital markets. At a time when investor confidence is battered and the SEC's leadership has garnered criticism, Edgar offers hope that e-government can work.

Edgar's value is not limited to investors, however. Before modernization, Edgar was a client/server-based system that didn't provide detailed information about each filing and its disposition or allow filers a way to easily prepare documents that they could use in other media such as print or online. Today, SEC examiners and analysts use the

repurpose data and build submissions piecemeal, and use the documents for other outlets such as annual reports or their own websites.

### Multiple Constituencies

The SEC's Office of Information Technology's humble home in an Alexandria, Va., industrial park belies the scope of the Edgar project. Today, Edgar is a workhorse of a system, each year processing 16 million pages of text from more than 200,000 filing entities and storing 1,200GB of data. Its modular design includes a website for filers, internal servers that automate workflow, a common enterprise data warehouse and an integrated accounting package that accurately processes fees. Through venues including *www.sec.gov*, the SEC provides access to regulatory data for millions of investors around the world. For subscribers—the third-party vendors that buy and sell Edgar

## Award-Winning Value

**THE SECURITIES AND EXCHANGE COMMISSION** modernized its existing Edgar system to accept and disseminate regulatory forms via the Internet. Edgar offers a prime example of e-government in action by transforming the interface through which the SEC's constituents access, transmit and distribute information. In the process of making financial data readily available to investors, Edgar helps the SEC increase the fairness of capital markets.





**Richard Heroux, Edgar program manager, used research on failed federal modernization projects to ensure Edgar's success.**

solicited input from financial printing companies, the National Academy of Science and investment industry experts before issuing an RFP for a new Edgar in 1997. There were several goals to the modernization, not the least of which was to take advantage of new technologies such as the Internet, XML and PKI. Specifically, the SEC wanted to ease filer burdens, improve the quality of documents and cut its own operational and maintenance costs.

But the SEC couldn't just rip out its client/server system and replace it with a multipurpose website. Each of the SEC's constituencies had unique and sometimes conflicting needs. Filers wanted the submis-

sion process to be as simple as possible, so they didn't want to get bogged down tagging every piece of data. Disseminators, however, wanted just about everything in a document tagged so that they could easily pull out information, put it in databases and conduct myriad analyses for their customers. As for investors, they wanted quick access to financial documents that looked good through their browsers.

### **Hard Work Up Front**

Heroux joined the SEC in 1997 as a systems analyst and was promoted to Edgar program manager to spearhead the modernization project. A 13-year veteran of the IRS,

Heroux used cost overruns, missed schedules and undelivered objectives as his criteria. Heroux studied projects at nine organizations including the Federal Aviation Administration and the Social Security Administration (see "Learning from Mistakes," at [www.cio.com/printlinks](http://www.cio.com/printlinks)).

Heroux had identified lack of management support as a mistake to avoid. In that area, Heroux had a fairly easy job of it. Congress mandated an upgrade and appropriated funds from the Office of Management and Budget, so there was no pushback from the SEC's top managers. Heroux sought to eliminate ambiguity from every aspect of the project. He outlined system requirements with users during the RFP process; if users wanted certain functionality but couldn't clearly define their requirements, Heroux put their requests on hold. When the RFP went out for bid, he had each vendor make several presentations as insurance against unpleasant surprises later. On July 1, 1998, the SEC awarded a three-year contract for \$22.5 million to TRW (at that time BDM International), marking the start of Edgar's modernization.

Heroux then set up user task forces to examine such issues as security parameters and user interfaces. Heroux assigned an HTML task force to the politically charged job of developing tags that would meet the needs of Edgar's diverse users without compromising the integrity of the system. "A few people really got burned out from the extra hours and left during the project," recalls Heroux.

Throughout the project, Heroux was vigilant on milestones and money, establishing hard and fast expectations up front, both for the project team and the contractors. The Edgar project had four major milestones ranging from three months for the initial implementation of a text management system to two years for building an integrated fee-processing system. Because of Y2K testing, development of the fee-processing system went beyond its slated schedule but fell within the project's three-year time frame. To hit the deadlines, the





Edgar team met often and conducted frequent milestone check-ins, holding closely to the requirements and not allowing the project add-ons that can lead to scope creep. As for the budget, Heroux let TRW know that \$22.5 million was all the SEC had to spend. During weekly meetings, “the contractor worked with us to the point where the scope of the project was managed to the dollar,” Heroux says. The oversight worked.

## One System for All

From the outset, the modernized Edgar was designed to fulfill the needs of a diverse set of users, an approach that required compromise. For example, the SEC chose to support an HTML-based data format primarily to help filers create multipurpose documents; but filers didn’t want to tag every piece of data. For disseminators, HTML tags worked fine as long as the documents contained no images. So the SEC asked filers to limit their use of images to those that represented important data or to images with corresponding text and required them to tag only the most important data such as financial tables. Disseminators could parse through the text and find data tagged with HTML without having to worry about sifting through images for important data.

For filers, Edgar makes compliance less onerous. Through the new website, filers can download six document templates to build their submissions using GUI-based screens. Filers use pull-down menus and click boxes to compile submissions for nearly 400 SEC compliance forms. The SEC’s XML-based filing format allows filers to submit HTML documents that can be easily repurposed by posting the data on their own website or printing hard copies

## How Edgar Works

**THE EDGAR SYSTEM IS BASED** on browser and Internet technology and the SEC’s network of Windows- and Unix-based servers. Filers submit compliance documents to the SEC via secure Internet connections utilizing VeriSign’s public-key infrastructure and an encrypted pathing using secure sockets layer. Filers use EdgarLink, GUI-based software built on PureEdge XML e-forms, to compile, build and transmit submissions via a website accessible through the Internet, dial-up or direct leased line. The filing information is automatically transmitted to an SEC server. Accepted filing information is transmitted automatically both for public dissemination and to the SEC’s enterprise data repository that consists of a relational database from Sybase and a document database from Fulcrum. All data is replicated to a hot backup site.

without reformatting or typesetting. Sixty-four percent of filers handle their own submissions (up from 50 percent premodernization), and 97 percent successfully file via Edgar on the first attempt.

For SEC employees, Edgar eases administrative tasks. Submissions that come in through the Web are fed automatically into the receipt and acceptance (R&A) server, where they are processed, validated and time-stamped. Fees are then processed automatically via a system that links Edgar to filers’ accounts at Mellon Bank in Pittsburgh. Within seconds of receipt, data is transmitted to an enterprise data repository where analysts and examiners can access it through an analysis and review (A&R) server, which tracks incoming submissions for review and resource allocation purposes. Employees customize queries to search the data and track their assignments. Finding the number of corporate “poison pills”—provisions designed to make takeovers unpalatable, for example—is as simple as typing the term into a search field. Correspondence can be attached to submissions so that employees can concurrently review a filer’s entire collection of documents.

Edgar’s effect on employees “has been fairly dramatic,” says Ken Fogash, associate executive director of the SEC’s office of filings and information services, and acting associate executive director (chief information officer) of the office of information technology. “With the single repository,

employees now have a consistent base of information to share.” Initially, the automated review function caused concern among some employees who feared their jobs—which involve analyzing submitted forms for discrepancies—would become dumbed down. Fogash says that hasn’t happened. “The cases of Enron and WorldCom show that off-balance-sheet activities require greater expertise” to analyze, he says.

For the SEC, the modernized Edgar has trimmed operational costs by \$150,000 per month. The system has 500,000 fewer lines of custom code than earlier versions. And four people are dedicated to Edgar, down from 30 employees before modernization.

Edgar’s modular design ensures that the system will grow as demand dictates. Each functional piece of Edgar is replicated throughout the system; if the A&R server goes down, for example, both the R&A server and the enterprise data repository can handle receipt functions.

The ultimate sign of Edgar’s success: Other government agencies at home and abroad consider Edgar an example of e-government at its best. Canada, England, Japan and Korea use Edgar as the model for building their own filing systems. In updating Edgar, the SEC implemented state-of-the-art technology but never lost sight of the needs of a diverse audience. **CIO**

**CIO.COM** The SEC’s Edgar project manager, **RICHARD HEROUX**, will be available to answer your questions online through Feb. 14. To post questions and read responses, go to **ASK THE SOURCE** at [www2.cio.com/ask/source](http://www2.cio.com/ask/source).

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# value judgments

## PROCESS

Enterprise Value Award winners must run a review board gauntlet and pass muster with five picky CIOs before they can claim the enterprise value mantel

By Richard Pastore

The Enterprise Value Awards judging process is a demanding one. More than 80 organizations entered their systems in the 11th annual CIO Enterprise Value Awards competition by the May 15, 2002, deadline. Beginning in June, CIO editors screened the applicants. To make it to the level of finalist, the systems had



**FAR LEFT** Awards cochair Richard Swanborg facilitates the judging process. **LEFT** The five CIO judges listened to six review board members present the details of the strengths and weaknesses of the finalists' systems, then debated the outcomes, in a meeting that stretched from 8 a.m. to 4 p.m. **RIGHT** Judge John Glaser argues the merits of a finalist.



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## THE JUDGES

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**Carolyn T. Purcell**  
**CIO**

State of Texas  
Austin, Texas

**John Glaser**  
**VICE PRESIDENT AND CIO**

Partners HealthCare System  
Boston

**Doug Barker**  
**CEO**

Barker & Scott Consulting  
Washington, D.C.  
Former CIO,  
The Nature Conservancy

**Rebecca Rhoads**  
**VICE PRESIDENT AND CIO**

Raytheon  
Lexington, Mass.

to have been deployed for at least two years, and the applicants had to satisfactorily demonstrate the benefits of those systems for the entire enterprise. Out went the applications that simply ported activities over to the Web or reduced inefficiency by automating manual labor. By September, the field had been narrowed to 11 finalists.

Then things got tough. The finalists had to face the review board; each company was visited by a member of this group to examine the system firsthand, to validate the data and to probe. "The review board members are trained researchers, have seen quite a few systems and applications, and as a result, they ask the tough questions to really find out about the enterprise value the applicant is getting from the system," says Richard W. Swanborg, president and founder of research group ICEx and Enterprise Value Awards cochair (with CIO Editor in Chief Abbie Lundberg). A review board member interviews the business sponsor and the IT sponsor, talks to users, and contacts customers and users outside the organization. (See "Review Board," Page 84.)

"What impresses me is, of course, the business value, but also the passion the people I'm meeting with have for the system, and their ability to articulate the business value," says review board member Madeline Weiss, president of Weiss Associates, a management consultancy in Bethesda, Md.

"The critical thing I look for when I'm doing a site review is the quality of the partnership that exists between the folks in information technology and the business," says Jim McGee, a consultant and clinical professor of technology and electronic commerce at Northwestern's Kellogg School of Management. "[In contrast,] I spend very little time worrying about the details of the technology."

### Judgment Day

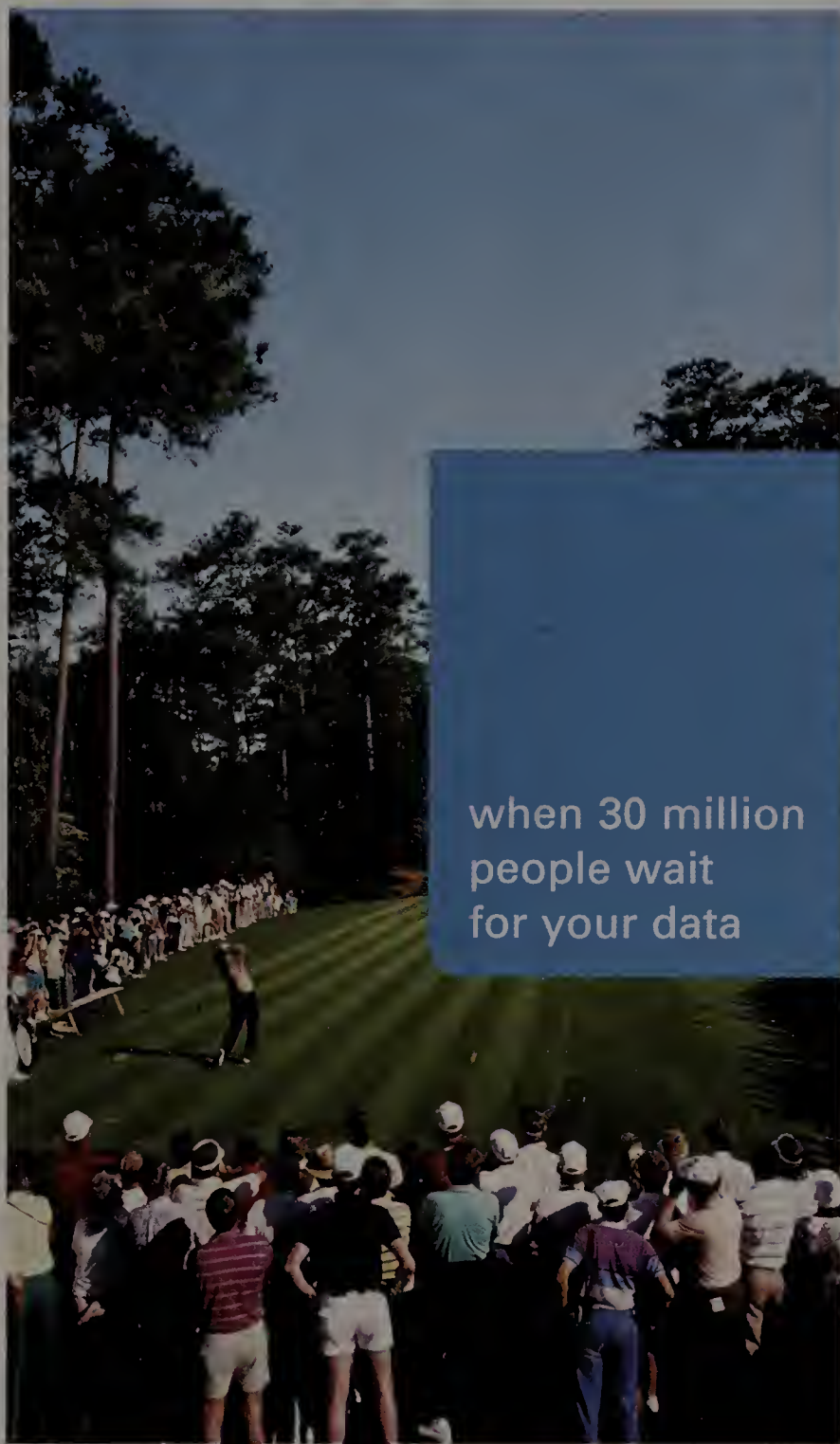
On Sept. 17, sequestered in a Boston hotel conference room for a day that stretched from 8 a.m. to 4 p.m., five CIO judges listened to six review board members present the details, strengths and weaknesses of the finalists. Cochairs Lundberg and Swanborg facilitated, clarified questions of criteria and made sure







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**RESEARCH PROFESSOR,  
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Boston University  
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Boston

the judges observed the ground rules. For example, the enterprise value needed to be in sync with the core business of the organization, not something tangential. And the judges were counseled that when assessing each finalist, they should not rank any particular form of value—be it financial, operational, transformational or societal—higher than any other. “The finalists either have to be good at delivering several [types of value] or exceptionally good at one to win the award,” says Swanborg. “That’s what the judges have to determine.”

### Pushing Back

Judges pushed and probed, challenged each others’ assumptions and asked the review board for clarification. “It’s a solid B2B application, but so what?” asked one judge about a finalist’s online customer service system. “They’re treading water in a competitive industry,” said another judge. “This is just ensuring survival.” Added another: “If there was more growth that resulted from superior customer service, they could claim that as

enterprise value. But there’s no evidence.” The vote was thumbs down for this one.

Eventually, the judges agreed on five winners plus two honorable mentions that were too strong to pass up (see “Nothing But Value,” Page 42). The judges were deliberately tough on the finalists and each other for the betterment of the award. “If one emerges as a winner, obviously, it’s a remarkable accomplishment, and the organization that does win should be quite proud,” says John Glaser, vice president and CIO of Partners HealthCare System in Boston, a veteran Enterprise Value Awards judge and former award honoree himself. “For the rest of the industry, the winners are people we can learn from and emulate. They represent why we’re all here, which is to advance the ability of our organizations to be as effective as they can possibly be.” **CIO**

Application forms for the 2004 CIO Enterprise Value Awards will be available April 1 on our website at [www.cio.com/eva](http://www.cio.com/eva). The deadline for entry is May 30, 2003. For more information, contact Special Projects Manager Lynne Rigolini at [lrigolini@cio.com](mailto:lrigolini@cio.com).



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# Emerging technology

INNOVATION and PRODUCTS in the VANGUARD

## Inside

### Cool Product

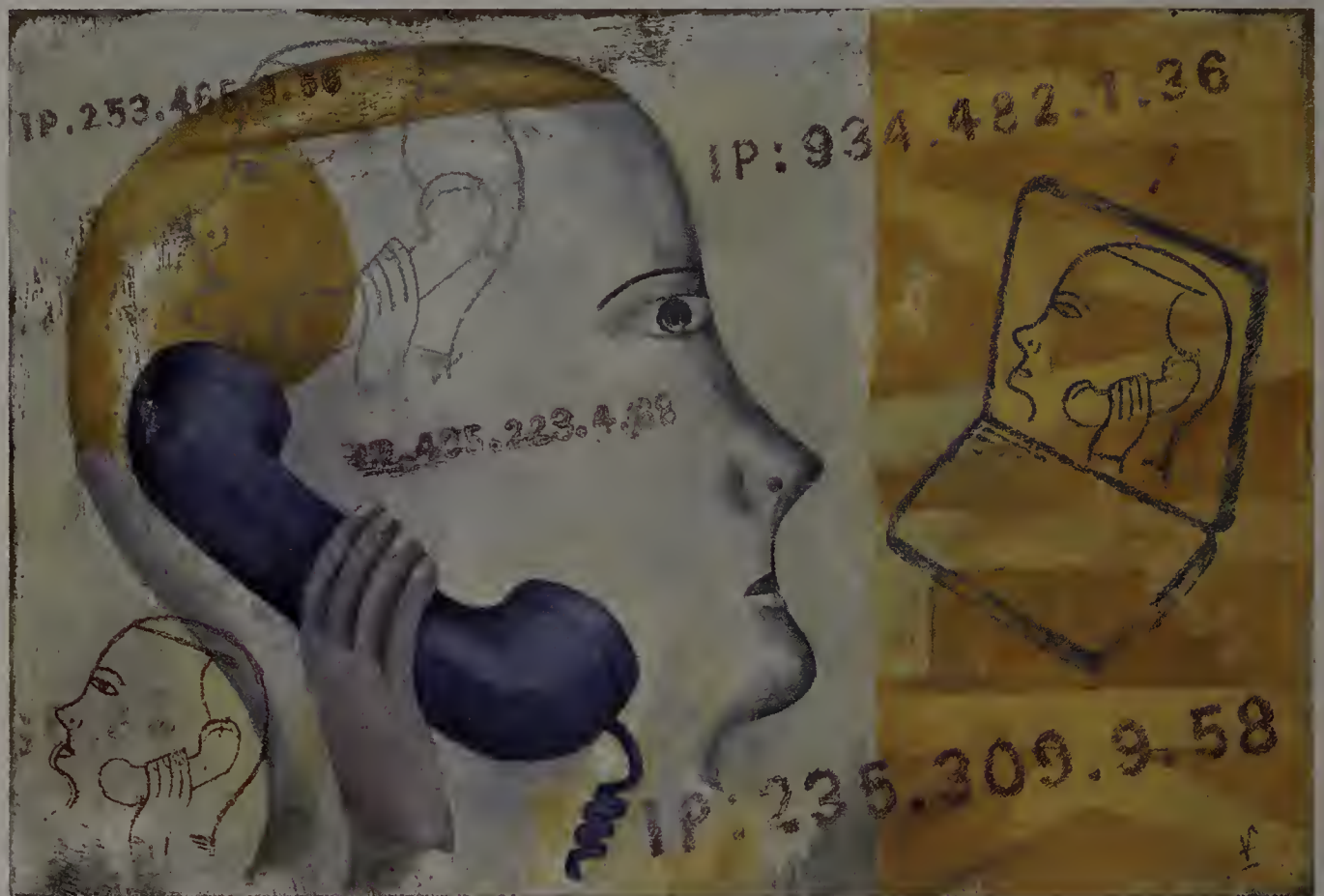
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## Net Talk Gets Real

*Voice over IP isn't an if; it's a when*

BY FRED HAPGOOD

*Edited by Christopher Lindquist. Send your thoughts and ideas for future columns to clindquist@cio.com.*

ON SEPT. 11, 2001, the phone company's central switching station serving the headquarters of New York City's Department of Sanitation (DSNY) was crushed by the collapse of the Towers. The very agency with line responsibility for the Her-

culean cleanup effort that would soon be required suddenly found itself unable to communicate with its offices and personnel. Even worse, DSNY headquarters soon learned it was on its own so far as restoring service was concerned; its telecom

VoIP...Golden alfalfa...Integration...SpamAssassin



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provider—Verizon—had its own wounds to look after. But the Sanitation Department's commissioner made his needs clear to MIS Director Steven Stam: He wanted his telephones back immediately, whether it was possible or not.

Fortunately Stam had a few functional assets, including a reasonably robust LAN and the knowledge that there was a fiber data line running through the building that did not terminate at the destroyed

Verizon facility. Strictly speaking, the fiber didn't belong to his department (it was leased by the Department of Health), but these were unusual times ("I begged, I borrowed, I was accused of stealing," Stam remembers), and by Monday, Sept. 24, he had started to lash those together to support a voice-over-IP (VoIP) network—using the LAN to carry phone calls and support a gateway into the public switched telephone network (PSTN). By the following Monday he received the go-ahead for the rollout, and the new phones began to ring one week later. With technical help from Dimension Data (a networking infrastructure services company in Reston, Va.), Stam had 285 VoIP phones running throughout the department's headquarters. Today, with 600 phones in three buildings on the new system, Stam is beginning to refocus on more traditional IS issues, such as tracking the reduction in costs. "Fifty percent of our phone calls are internal," he says. "The savings we get from putting those calls on the network are already substantial."

It is widely accepted that sooner or later VoIP (also widely referred to as IPT, for Internet protocol telephony) will sweep the board, offering the promises of simpler management, lower costs and voice-application integration. The analysts predict it. The hardware and software vendors promote it. Even the telcos have

begun to get in on the act. However, even the most enthusiastic advocate for the technology has to concede that at least for the moment, old-fashioned switched connection telephony is pretty good at its core mission: quality calls at high levels of reliability. VoIP features such as point-and-click dialing, integrated voice mail/e-mail management and CRM-to-caller-ID integration would be nice to have, no doubt—but none are yet mission-critical.

Further, VoIP is inherently demanding on the underlying network. Packet delays and losses that no one would even notice during Web surfing can make voice applications unusable. At the same time, telephony is perhaps the most important infrastructure service. From a network services point of view, supporting VoIP means becoming extremely dependable about delivering very high levels of performance. Moving to such a demanding technology can mean lots of network upgrades, acquiring smarter traffic monitoring tools and practices, organizing end user training sessions, and managing the delicate business of integrating two service groups (telecom and data services), each with its own culture. Timing such a labor-intensive step can be a difficult call.

### One Toe at a Time

To date most VoIP transitions seem to be triggered by major changes in the corporate environment, such as a significant divestiture, acquisition or relocation. Some companies, however, are finding alternate paths: incremental transition strategies that move the enterprise toward VoIP one step at a time, minimizing up-front costs

and risks while maximizing education.

FedEx Freight, headquartered in Memphis, Tenn., is the part of FedEx devoted to the delivery of fairly small ("less than a truckload") units of freight between businesses. By nature it is a highly distributed operation, with 335 facilities scattered around the United States. Jeff Amerine, managing director of Communications Network Services, says that when the impending arrival of VoIP became obvious, he decided to concentrate on transporting calls among PBXes over the company WAN, putting desktop telephony and other end user applications on hold. About two years ago he set up a series of lab tests and field trials. Once those were completed, he defined a group of offices that were smaller than average ("Where you could cut your teeth with less risk," he says) and whose PBXes were nearing the end of their useful lives. He equipped the more than 30 offices that met both criteria with a VoIP-enabled PBX system from a large global manufacturer and watched WAN traffic behavior for six months. Then he rolled out the service to another 40 locations. Amerine says he expects to have all FedEx Freight's facilities sending phone calls over the WAN by 2004.

He notes that the big surprise and lesson of his experience is the large number of tweaks—mostly hardware and software upgrades—needed to bring network quality of service up to the level required for voice. He adds that these tweaks are sufficiently sensitive to local features that an IT department would be well-advised to develop the necessary network expertise in-house. And incremental VoIP introductions give the IS department the time to master those skills.

Even companies with considerable experience with VoIP move cautiously into this new terrain. Halliburton Energy Services, the Houston energy giant, has been experimenting with WAN-based VoIP since 1996. (Currently about 15 percent of the company's more than 100 sites can place calls over the Halliburton WAN; there

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Message

FOR Mark

MESSAGE Sales RFI needs a quality affordable printer for our remote field offices to print proposals, presentations, etc. - please advise.

JW

Message

FOR Mark

MESSAGE Remote office automation project meeting Tuesday

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FOR Mark

MESSAGE We need nationwide service/support for our planned printer project - any suggestions?

mk

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would be more, but VoIP is restricted by law in many of the countries where Halliburton operates.) In late 2000, Andy Knight, who is responsible for Halliburton's network communications (his actual title is Chief Gadget Guy), decided to begin moving to IP telephony. His first step was to install an experimental system that ran in parallel with a conventional PBX and

and shipping and receiving, but drew the line at moving senior management onto the system. "Given the value of the people and processes involved, we didn't feel we could do justice to an IP installation at the moment," he says, though a switchover to an all-VoIP system is still scheduled during the next 18 months. Meantime, Knight is moving on another issue just as

## From a network services point of view, supporting VoIP means becoming extremely dependable about delivering very high levels of performance.

carried calls only among members of a single office (with no PSTN gateway). He used this system to support experiments with features and build bandwidth utilization models.

By late 2001, Knight had gained enough experience to move the technology into a production setting. Once again, he picked the site that would deliver the most education for the least risk, specifically Landmark Graphics' (a wholly owned Halliburton subsidiary) London office, which was then moving into a new building. "We had all the business groups there but in a smaller package than in Houston," Knight says. (The London installation came to about 150 phones.) Like Amerine, he found that VoIP networks are picky about where they choose to work. "Laying a cable over a light might not affect performance in a conventional network, but even low levels of electrical interference can be a problem for voice," he says. Knight also agrees with Amerine that companies need to have their own expertise on the technology: "VoIP is still too new to expect contractors to know all these details themselves."

When Landmark moved to new offices this January, Knight provided desktop telephony services for procurement, IT,

incrementally: introducing a small number of "softphones" that ring right on laptops or notebooks. "You can check into a hotel, plug in the laptop, start up the phone, and so far as anyone can see, you're right in your office," he says.

### Building on Voice

Some systems offer structural points of entry. Recently Bruce Elkington, CIO of Overlake Hospital in Bellevue, Wash., began thinking about the expense of installing conventional telephony in a building Overlake was planning to erect. VoIP seemed a logical alternative, so Elkington looked for a controllable installation that would give him some experience with the new technology. At one point he heard that the nurses on the general surgical unit were looking for cordless phones to supplement the unit's noisy and inefficient paging system. Elkington knew a wireless data network was already available (and used to serve the data devices carried by clinicians making their rounds), so he decided to take advantage of it to carry wireless VoIP.

His experience reinforces the points made by other VoIP implementers: 1. Network provisioning and configuration requires lots and lots of fine tuning; 2. Installation partners and contractors sel-

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According to Level 8, the product can combine applications under one "composite user interface," providing users with easy, consolidated access to multiple applications, regardless of where those applications reside. The result is lower training costs and reduced training time.

Pricing begins at \$1,095 plus \$59,500 for the required Cicero Development Framework software, which includes five developer licenses, the configuration tools and a corporate connector kit. For more information, visit [www.level8.com](http://www.level8.com).

—Christopher Lindquist





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dom know as much as they think they do; and 3. Once the system is working, it works very well indeed. "It just took a few days before everyone said, We want one of those things too," he says. Today Elkington is planning an expansion to 150 VoIP phones and is quietly confident that he is going to save a lot of money for his employer when the new building goes up without need for telephone cable. But he strongly endorses the strategy of defining an "educational" VoIP project before jumping into a major makeover. "If you don't find a way to get comfortable with the technology first, you're going to end up with a tin cup," is how he puts it.

These examples illustrate ways to design an incremental strategy: smaller versus larger offices, peripheral versus central enterprise functions, IS versus the rest of the company, WAN versus LAN (or vice versa), limiting the number of initial users, picking the offices with the oldest equipment or by capitalizing on a preexisting hardware base.

The particular strategy matters less than having one. The reason Steven Stam was able to work so fast that September, for instance, was that he already had run a VoIP project for months—in his case, a system that ran off the department LAN was distributed to headquarters but ran parallel and redundant to the PSTN system. People could use it as they pleased. And as they drifted on to the system, Stam was able to cut his teeth on VoIP.

Stam launched his experiment because of trends in the underlying economics. "I could see that prices kept coming down on the data side and not coming down on the telecom side," he says. But because he had done so, he was ready when his world changed in the most unexpected way. It's a useful lesson in this era, when the world might change as much for any of us at any time. ■

Fred Hapgood is a freelance writer based in Boston. He can be reached at [hapgood@pobox.com](mailto:hapgood@pobox.com).



#### UNDER DEVELOPMENT

##### Nanotech mining

## Golden Alfalfa

**USING ALFALFA PLANTS TO HARVEST** gold sounds ridiculous—sort of like using broccoli to dig for diamonds. But Jorge Gardea-Torresdey, chemistry department chairman at the University of Texas at El Paso, says alfalfa filtering is a potentially efficient and cost-effective way of retrieving gold nanoparticles. Best of all, the process is environmentally friendly.

The existing methods of producing gold nanoparticles, used for electrical contacts in nanoelectronic circuits, require expensive and toxic chemical processes. Gardea-Torresdey's approach taps alfalfa's natural ability (called phytoremediation) to extract minerals from the medium it's growing in. Alfalfa planted in places where gold naturally accumulates, such as near gold mines, can retrieve significant amounts of the metal. "I think we can eventually get 20 percent of the weight of the plant in gold," he says.

Gardea-Torresdey's research dates back to his teenage years. Working in a mining laboratory near his home village of Parral in northern Mexico, Gardea-Torresdey became fascinated with the idea of using plants to suck up toxic mine tailings. Nearly 30 years later, Gardea-Torresdey started applying the same approach to harvesting useful metals—such as gold. He focused his efforts on alfalfa. "Alfalfa can pick up metal better than other plants," he says. Experiments conducted with alfalfa grown in soil imported from Parral yielded positive results. Working with colleagues at the University of Texas at Austin and Stanford University, Gardea-Torresdey discovered that the gold stored inside the plant was nearly identical to gold particles produced through chemical processes. Getting the metal out of the alfalfa also proved to be easy. The gold is isolated and extracted by simply mashing up the plants and then spinning the goop inside a centrifuge.

Gardea-Torresdey admits that the technique still needs additional refinement and testing. But he's hopeful that his process will eventually become the preferred method of extracting gold particles from soil. "That would be a dream come true," he says.

—John Edwards





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## COMPANY TO WATCH

Deersoft

# Dawn of a Spam Killer

*Deersoft moves from open-source roots to enterprise spam blocking*

BY CHRISTOPHER LINDQUIST

**CAN'T MISS MONEY MAKERS.** Improved masculine stamina. Fun with farm animals. Sexy schoolgirls. It's all there waiting for us in our e-mail every morning. Beyond being time-consuming to sort through and delete, those unwanted messages can also be downright offensive, creating an HR nightmare that has many IT departments looking for some relief.

One of the newest players in the anti-spam field is San Mateo, Calif.-based startup Deersoft. The company's products are based on an open-source antispam software project called SpamAssassin ([www.spamassassin.org](http://www.spamassassin.org)), which was started in 2001 by Irish programmer Justin Mason. Not long after, Craig Hughes, CTO and cofounder of Deersoft, began working with Mason to enhance the software. That initial work led to a round of funding from venture capitalist Gordon Kruberg, and Deersoft was born.

Deersoft took the open-source product (which Hughes still maintains) and turned it into a more slick, packaged tool that could appeal to a wider audience—and be sold at a profit. The results are SpamAssassin Pro and SpamAssassin Enterprise.

SpamAssassin Pro—the company's first product—sits inside a desktop client (currently Microsoft Outlook, but soon to also be Outlook Express) and monitors every piece of incoming mail for off-color content and other telltale signs of spam. Users can tweak the included rules and automatically import their address books to help keep the number of false positives to a minimum. Deersoft also uses its own staff and a worldwide net-

## Deersoft

**Headquarters** San Mateo, Calif.

**Founded** June 2002

**Employees** 12

**2002 revenue** NA

**Products** SpamAssassin Pro and Enterprise

**Reason to watch** Antispam tool based on open-source spam-killing project. Uses volunteer spam reporters around the globe.

**Hurdles** Small company with bigger, more established competitors. Must prove that the reporting network concept can work quickly enough for enterprise purposes.

**Website** [www.deersoft.com](http://www.deersoft.com)

work of spam reporting volunteers to create more rules as spammers get increasingly sophisticated.

SpamAssassin Enterprise looks to keep the spam from ever reaching the users' desks. It lives on a Microsoft Exchange server and acts as a blockade against spam at the corporate perimeter. Unlike some other enterprise spam-fighting tools, however, SpamAssassin Enterprise gives users—not just IT managers—access to the reserved spam box so that they can check for any missing nonspam mail. Plus users can tweak personal rules to tailor the product for their own needs beyond what the enterprise may already be doing.

Even so, Deersoft faces challenges, says Joyce Graff, vice president and senior analyst at Gartner. The company, for instance, doesn't have a dedicated staff working

24/7 to create the profiles that it uses to stop spam, unlike some competitors such as Brightmail. That lack, Graff says, can make spam filtering someone's full-time job—a task most IT departments would rather avoid.

Deersoft's current customers seem willing to make the trade-off, however. Jeff Arndt, systems administrator at aerospace analysis and visualization tools vendor Analytical Graphics, was looking for an alternative to Trend Micro's ScanMail eManager, which he felt lacked flexibility, when he discovered SpamAssassin—and he remains happy with the choice. He's primarily pleased with the fact that SpamAssassin allows end users to examine their own spam mailboxes and to create their own rules. "It lets people deal with their own spam," he says. Before SpamAssassin, users were required to send junk mail to an administrative mailbox so that IT could deal with the problem.

That flexibility is also key for Vicki Prugh, a senior software developer at chemical industry consultant SRI Consulting. Prugh's users were getting buried in offensive spam. "People were getting physically and emotionally upset," she says. But those same users—many of them analysts—needed to be sure that important e-mail got through to them. "With SpamAssassin, individuals can say, Let this go, it's OK," Prugh notes.

Good tools alone won't guarantee success in this spam space, however. And Deersoft is a tiny company that faces stiff competition both from software vendors such as Trend Micro and SurfControl as well as services from the likes of Brightmail, MessageLabs and Postini.

But one thing is certain—you can never have too many competitors in the battle against spam. **CIO**

CIO isn't the only one watching Deersoft. Just prior to this story going to press, the company was acquired by Network Associates, which says Deersoft tools will merge with the company's product line in the second quarter of 2003.



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### SUNDAY, APRIL 27

8:00 am–1:30 pm  
**Golf Tournament**

3:00 pm–5:00 pm  
**Registration**

6:00 pm–8:00 pm  
**Registration, Welcome  
Reception & Golf Awards**



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### MONDAY, APRIL 28

7:00 am–8:00 am  
**Networking Breakfast**

8:00 am–8:15 am  
**Welcome**



**ABBIE LUNDBERG**  
*Editor in Chief,  
CIO Magazine*



**JONATHAN ZITTRAIN**  
*Conference  
Moderator and  
Co-founder,  
The Berkman  
Center for  
Internet &*

*Society, Harvard Law  
School*

8:15 am–9:15 am  
**The Complete CIO**



**CHARLIE FELD**  
*Founder, The  
Feld Group &  
Former CIO of  
First Data*

*Resources, Delta Air Lines,  
Burlington Northern and  
Frito-Lay*

The CIO role has evolved dramatically over the past several years; the nature of the job is more complex than ever—and the tough economic climate necessitates keeping an ever-vigilant eye on bottom-line pressures. CIOs increasingly have more of a hand in defining and driving corporate business strategy. And everyone—business line managers, the

executive management team, the CEO, the Board of Directors—has greater expectations of their CIO. What are the essential skills and attributes needed to thrive in the CIO role today? Charlie Feld talks about his own experiences over time as CIO of very diverse businesses, and what his client companies demand today as they look to the CIO's organization to continually help transform the company.

9:15 am–9:40 am  
**State of the CIO Survey  
Results Highlights**



**LORRAINE COSGROVE**  
*Research  
Editor, CIO  
Magazine*

9:40 am–10:30 am  
**View from the Top:  
Creating Value Through IT**

A top executive shares his viewpoint on the role of IT, and the criteria for measuring a CIO's ability to articulate and deliver true IT value to the enterprise.

10:30 am–11:00 am  
**Coffee Break and Sponsor  
Exhibits**

11:00 am–11:45 am  
**Sponsor Briefings**

11:55 am–12:40 pm  
**Sponsor Briefings**

12:45 pm–2:15 pm

### Networking Lunch

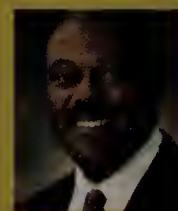
2:30 pm–3:45 pm  
**View from the Front Lines:  
Delivering Value  
Through IT**

**Moderator: JONATHAN  
ZITTRAIN**

**PARTICIPANTS:**  
**HOWARD RUBIN**  
*Vice President,  
META Group, Inc.*

A blue-ribbon panel of executives discuss making the business case for IT initiatives, the do's and don'ts of portfolio management, critical success factors in doing post-implementation audits—and the importance of clear communicating all along the way.

3:45 pm–5:00 pm  
**The CIO Interview**



**MONTE FORD**  
*Senior Vice  
President &  
CIO, American  
Airlines*

Ford took on the top IT spot at the world's biggest airline at the end of 2000, then had to deal with the acquisition and merger of TWA, the economic recession, Sabre selling its outsourcing business to EDS—and the events of 9/11. CIO magazine editor in chief Abbie Lundberg talks with Ford about his pivotal role in the organization and his plans for the future of IT.



5:00 pm–6:30 pm  
**CIO Peer-to-Peer  
Networking & Reception**

## **TUESDAY, APRIL 29**

7:00 am–8:00 am  
**Breakfast & Informal  
Discussion Roundtables**

8:00 am–8:45 am  
**What Every CIO Should  
Know About Digital Rights  
Management**

**JONATHAN ZITTRAIN**

Entertainment companies aren't the only ones with digital content worth safekeeping. More companies now are realizing the potential threats and are seriously weighing the risks of not implementing digital rights management (DRM) technologies. These technologies can leverage your work if you produce content—and confound it if you consume it. They are infusing everything from video to text. Zittrain explores recent trends in DRM deployment, and discusses the impact on businesses of all types.

8:45 am–9:45 am  
**Best Practices for Evaluat-  
ing Hot New Technologies**



**Moderator:**  
**MARTHA  
HELLER**  
*Director, CIO  
Magazine's  
Best Practice*

### **Exchange**

It's the universal problem for CIOs: hot new technologies confront you daily and you need to make the decision to adopt or ignore every single time. If you hop on the hype, you could risk millions—along with your reputation—but if you hang back and wait, you could miss the boat. This panel of CIOs, drawn from the CIO Best Practice Exchange, CIO Magazine's private online network of senior IT executives, offers practical advice for evaluating the "next best thing."

9:45 am–10:30 am  
**Becoming a Trusted  
Business Partner**

The CIO's sphere of influence has never been larger. You must work with executive management and peers, internal and external customers, line of business directors, staff and vendors. You must set and achieve both strategic and tactical goals, articulate and demonstrate ROI, communicate and manage expectations. One CIO shares the benefit of their experience.

10:30 am —11:00 am  
**Coffee Break &  
Sponsor Exhibits**

11:00 am–11:45 am  
**Sponsor Briefings**

11:55 am–12:40 pm  
**Sponsor Briefings**

12:45 pm–2:00 pm  
**Networking Lunch**

2:15 pm–3:30 pm  
**InFocus Workshop  
Breakout Sessions**

InFocus Workshops are designed to give conference attendees the opportunity to meet in smaller groups, and discuss specific topics and issues in greater detail.

3:45 pm–4:45 pm  
**Developing the Next  
Generation of IT Leaders**



**Moderator:**  
**RICK  
SWANBORG**  
*President,  
ICEX*

In addition to honing their own leadership abilities, CIOs are concerned with identifying and developing effective leaders in their organizations. How do you train the technical staff to better understand and communicate with the business side? How do you pick the person to spearhead a key initiative? How do you effectively delegate responsibility? Swanborg and a panel of CIOs discuss the challenges

involved, and share the techniques they've used to mold the next generation of IT leaders.

4:45 pm–5:30 pm  
**How to Get a Life**



**DR. RICK  
BRINKMAN**  
*Doctor of  
holistic medi-  
cine and  
author of Life*

**By Design: Making Wise  
Choices in a Mixed-Up  
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# EXECUTIVE

# Summaries

February 1, 2003

## SPECIAL ISSUE: THE 11TH ANNUAL ENTERPRISE VALUE AWARDS

The winners of the 2003 Enterprise Value Awards all demonstrate the need for making solid business cases when investing in technology.

### **WINNER University of Illinois Medical Center's Electronic Records System** *By Christopher Koch* | 46

**WHILE MOST HOSPITALS DREAM** about electronic patient records and the benefits of reduced errors, faster record retrieval and enhanced communications, most have failed to build systems that actually get used. But this Midwest teaching hospital has not only built a functioning system, it has convinced nearly all of its doctors to use and rely on it. It wasn't easy. Filling in electronic records takes longer than scribbling notes on paper. But the efficiencies of instant retrieval, pop-up electronic notes and automated screening for medication errors won over the hearts of nurses, who in turn helped the physicians see the advantages.

### **WINNER The Wharton School's Research Data Services Toolset** *By Elana Varon* | 52

**WHARTON BUCKED ITS OWN** established norms when it made the controversial decision to offer an internal academic research storage and retrieval system to the outside world—including to its fiercest B-school competitors. The Wharton Research Data Services (WRDS) system, a Web-based collection of 100 finance and accounting databases and statistical analysis tools, was originally developed to aid the research of Wharton's own faculty and students. It sounds illogical to provide this same advantage to competing schools, but by licensing WRDS to other institutions, Wharton not only fulfilled its mission to disseminate knowledge, it generated revenue to fund system maintenance and enhancement. Most important, it gained international promotion of its brand, since the Wharton name travels with the system wherever it's deployed. This makes WRDS a formidable weapon in the ongoing battle with other top-tier schools to attract star researchers.

### **WINNER Con-Way Transportation Services' Truck Routing Expert System** *By Richard Pastore* | 60

**TO COPE WITH GROWTH**, Con-Way needed an expert system to craft the most efficient possible routing for its nationwide freight-trucking business each night. But such systems are bleeding edge and found mostly in university labs. Academics offered to help, but Con-Way would have to modify its business model to adapt to the system. Nothing doing, the company decided; the business model was its competitive edge. Instead, Con-Way teamed a resident

industrial engineer and rocket scientist with somewhat reluctant dispatchers to devise an internal system governed by the dispatchers' business rules. After a protracted birth, the system proved capable of developing a nightly routing plan that optimizes efficiency while ensuring on-time delivery. Con-Way recouped its costs within two years by paying fewer drivers, packing more freight per trailer and reducing damage from rehandling.

### **WINNER Health Decisions' Data Collection and Analysis Process** *By Ben Worthen* | 68

**HEALTH DECISIONS**, a 14-year-old clinical research organization that processes trial data for prospective new medications, is a small fish in a very conservative industry pond. Since millions of dollars in development costs (not to mention millions more in potential profit) are at stake, pharmaceutical makers and the companies that process their clinical data are loathe to try anything risky. But Health Decisions' founder was willing to rock the boat. The company chose appropriate (not leading edge) technologies to remake the process for collecting, analyzing and processing clinical drug trial data. The system brings real-time management to an industry accustomed to waiting months for data analysis to be communicated, and has achieved a significant reduction in the average time and cost to process and conclude clinical drug trials.

### **WINNER Securities and Exchange Commission's Data Management System** *By Megan Santosus* | 74

**THE SEC MODERNIZED ITS VENERABLE** financial data gathering, analysis and retrieval system, Edgar, to take advantage of the Web. However, the reincarnated system had to satisfy each of the SEC's external constituencies, which had unique and sometimes conflicting needs. Corporate filers wanted the submission process to be as simple as possible so they wouldn't get bogged down tagging every piece of data. Third-party data vendors wanted just about everything in a document tagged so they could easily pull out specific information for their customers. Investors wanted quick access to financial documents through their browsers. In the end, the SEC managed to meet all those needs and at the same time prove that federal agency IT projects don't always end in disaster. Now Edgar is a model for e-government and is being copied in other countries.



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